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THE NAUTICAL MAGAZINE

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NAVAL PROGRESS.

WE are nearing the completion of the famous "Hamilton" programme, and as it is supposed we are shortly to witness the official decease of the present naval administration, it is not inopportune to glance at the work accomplished. The last few years have witnessed a perfect revolution in the, perhaps, most conservative institution in the world, and it is beyond question that the Royal Navy of to-day is, as regards its composition, fighting efficiency, and organisation, in a better state for warlike operations than at any previous period. The work accomplished during the past two years has been enormous, and the greatest credit is due to the Admiralty staff for the magnificent results achieved. We are justified in saying that the Admiralty organisation must undoubtedly be very good, else the satisfactory completion of the largest Admiralty programme would have been impossible. It shows, that should occasion require it, our public and private shipyards could produce as many war-vessels as all Europe could in a year.

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Just three years ago, the Naval Defence Act was passed, by which the construction, at a cost of £21,500,000, was authorised of—

10 Battle-ships (*Royal Sovereign* and *Centurion* types).
9 First-class protected cruisers (*Edgar* type).
29 Second-class ,, ,, (*Apollo* type).
4 ,, ,, ,, (*Pallas* type).
18 First-class torpedo gunboats (*Gossamer* type).

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70 Total ships.

Of these vessels, 38 have been, or are, building in the Royal dockyards, and the remaining 32 by private shipbuilders. Speaking generally, all of these vessels, which so far have been tested at sea, have given great satisfaction, some indeed have more than fulfilled expectations, and thanks to the scientific energy of Mr. W. H. White, R.N., more than to any other official, the reproach of "partial success" which has clung so persistently to naval ships, is almost, if not entirely, removed. We propose to deal with some features of our naval policy, in order to assist the officers of the R.N.R. to keep themselves *au fait* in naval matters. During the present year nearly all the vessels mentioned will be completed. We shall then be in a position of tolerable defence, but the standard aimed at, viz., that we should be as powerful as any two naval powers will not be reached. For instance, on the completion of the vessels built under the Naval Defence Act, we shall have 13 first and second-class battle-ships, that is, in addition to those existing when the Act was passed. Our activity has stimulated the Continental powers, and especially the United States; and our increase of 13 vessels will be balanced by 30 first and second-class built in France and Germany, or 21 built in France and Russia, or 33 built in Germany and Russia. It is, of course, easy for the economist to say that in the game of building other nations can play as well as ourselves. We have the consolation of knowing that we, at any rate, can afford it, and in this, as in most matters, the victory is with the long purse. On the completion of the Hamilton programme we shall have:—

45 First and second-class battle-ships.
19 "Look-out" ships or, more correctly, steam frigates.
20 Torpedo-boat catchers.
12 Coast defence ships.
18 Armoured cruisers, and

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57 Protected cruisers.

Or a fleet of 171 war-vessels.

It is eminently satisfactory to learn that the policy which produced the Naval Defence Act is not to be allowed to lapse. The next Parliament will be asked to sanction a scheme of ship-building as large and as comprehensive as that now being completed. If honourable members can be persuaded that our national safety consists in being the "strong man armed," the money necessary will be voted. Much, however, will depend upon the temper of the new House of Commons, and if the peace and arbitration cranks abound, we certainly shall not obtain the number of ships and men which are deemed necessary for perfect protection. During the present financial year it is proposed to spend £14,240,000.

The programme includes the construction of three new battle-ships, which, if we may judge by the First Lord's statement, will be improved *Royal Sovereigns*, in which particular attention will be paid to speed and coal capacity. The maximum speed is to be 19 knots. Our new eight first-class battle-ships, of which the *Royal Sovereign* is typical, are, in nearly every respect, perfect so far as our present knowledge goes. They embody the ideas of those who will have to fight them, and so fulfil the condition of being satisfactory weapons. These vessels are, indeed, the embodiment of strength and beauty. Their under-water sections are simply lovely. Something similar to these are the two second-class battle-ships *Centurion* and *Barfleur*—these vessels are smaller and less heavily armoured. All these ten vessels are, in their leading features, alike; that is, they have a flush upper-deck and a high freeboard, great speed, and considerable coal endurance; the former being 17 knots under forced draught, with storage for 900 tons in the first-class, and 750 tons in the second-class. Their great defect is that they could not maintain full speed for a run from Plymouth to Gibraltar, because their coal would be exhausted. The *Centurion* and *Barfleur* are, however, capable of keeping the sea on distant stations, being wood-sheathed.

Perhaps as useful a class of war-vessel as any is the *Edgar* class. These are first-class protected cruisers. They are very fast, powerfully armed, and well-protected vessels, which could overhaul, or, rather should overhaul, any ocean merchant steamer. We think that the number of this class might be increased with advantage. A very smart class of ship, and one which is a great favourite, is the *Apollo* class. Here we have

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the seaman and engineer unanimous. Neither like very large vessels. The seaman prefers moderate size. In these vessels, the displacement is but 3,400 tons, but the engines are very powerful, being 9,500 H.P. under forced draught. The armament and protection are well adapted for the type of vessel. These cruisers, including those of the former type, are splendidly thought-out vessels, and will, we feel sure, be equal to more than their purpose; they, however, in our opinion, are limited in their sphere of usefulness by their small coal supply. As the questions of naval machinery and coal endurance are so closely allied, we shall here digress and offer some criticisms on these matters.

We shall not imitate the practice of the newspaper critic and dismiss the machinery question with the remark that "the machinery is too light," and so forth, but will endeavour to indicate the reason for some of the grave failures which have recently occurred. Here we must remind our readers that comparisons made between merchant steamers and war-vessels are in most cases perfectly useless for the purpose of estimating relative efficiencies. In the Merchant Service a designer has ample space and displacement at his disposal. He is encouraged, and, in fact, practically compelled to have machinery spaces of adequate size in order to obtain the 32 per cent. reduction off his gross tonnage. Now, when the speed required is but moderate, it is found that there is in modern steamers a large amount of utterly useless space in the vicinity of the propelling machinery. Cargo cannot be carried in it; it is too warm for use by passengers, and usually it cannot all be occupied by bunkers. In the engine-room the great height gives opportunity for the employment of long strokes, long connecting-rods, and tail-end piston-rods. Long strokes mean for a given power smaller piston area; therefore less weight, a less inertia, less pressure on guides, less piston friction, owing to less rubbing surface. While a long connecting-rod means that the thrust of the connecting-rod on the guides is reduced considerably. In short, it may be said that the great reason why the *Teutonic*, *City of Paris*, and *Umbria* run for such long periods and with such total immunity from hot bearings, &c., is chiefly because they use long strokes and long connecting-rods. It is a well-known fact in connection with these vessels, that, had they not been constructed to comply with Admiralty requirements, the connecting-rods would have been some two feet longer than

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they are. This remark is also true, we believe, of the three *Empresses* running between Vancouver and China.

In the Navy steamer the water-line fixes the possible height of the machinery, although in recent vessels the cylinder top extend above this, and protection is afforded by means of a glacis work. As a general rule, the machinery which lends itself to a fairly good system of protection must be situated low down, hence, for a given power, we find cylinders of large diameter, short stroke, and short connecting-rods; in other words, we have all the conditions present which are inimical to fast and continuous running. We are aware that in many of the latest cruisers continuous running at high speed has been deemed so important a matter that the engineer has been allowed to have his way, and thus in the *Blake* class, the *Apollo* class, the *Katoomba* class, we find a species of barbette or glacis work erected above the protective deck enclosing the cylinder tops. The results in speed attained by the vessels of this class have more than justified the departure. The *Blake* and *Naiad* are two typical vessels in which the ideas of the designer have been in these matters more than fulfilled; on the other hand, the *Aurora* class are by no means perfect successes, they have very powerful, short stroke, horizontal engines, and simply cannot run for very long periods at full speed. As regards the weight of naval engines, we are by no means prepared to join in the general chorus of "too light." We certainly do say that most merchant steamers have machinery which is "too heavy." But here, again, the conditions in the two services preclude a comparison, the owner of the tramp does not gain anything from a saving in weight. Cast-iron box columns, with a cast-iron condenser cast in with the back columns and heavy air and circulating pump attachment, are at once cheap to make, simple in design, enormously strong, and absolutely reliable. They are also very heavy. Engines to develop the same power could be carried on three tripods, one set to each cylinder. The condenser could be of brass, and tiny engines might replace the heavy air pump and circulating pump, but then the task of the designer, the pattern-maker, the fitter, is rendered much more difficult. The cost of such engines would be greater, while their efficiency as machines would not be higher, their weight is much less.

Again, to develop a given power with a given steam pressure the variables are piston area, stroke, and revolutions. We

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can arrange the engines to give off the required power, say, at 60 revolutions, or by different proportions and smaller dimensions we can get the power only at a high number of revolutions, say 140. Many papers are very fond of expatiating upon the performances of the Atlantic steamers, but really there is nothing to boast of in the way of engineering. It does not take much knowledge to ensure strength and rigidity, especially when the designer is left a perfectly free hand in the matter of weight. There is more engineering skill and true science, and, therefore, more credit is due to the designers of the machinery of such vessels as the *Naiad* and *Edgar*, and to Yarrow & Thorneycroft, than attaches to the design of the most successful Atlantic liner. There is certainly one fact which is very prominent, and that is, that the machinery of the latest Atlantic liners is from two to three times as heavy as is necessary, and that the factor of safety is ridiculously high. The great merit in an express locomotive, an Eiffel Tower, or a Forth Bridge, lies in the fact that we have beauty, strength, safety, associated with a total absence of superfluous weight. From the engineering point of view the machinery of the *Hawke* is superior to that of any Atlantic liner.

From such divergences in the practice of the Royal Navy and Merchant Service, it will be gathered that the weight of machinery varies greatly, ranging from 510 lbs. per I.H.P. in the case of a large ocean passenger steamer, to 405 lbs. per I.H.P. in modern cargo boats, and averaging about 110 lbs. per I.H.P. in the case of naval vessels. If 110 lbs. is, as the critics tell us, too light, then 405 lbs. is surely too heavy. As a matter of fact, it is possible to construct engines possessing all the advantages of the best design of the mail steamer type, with the absence of useless weight, and which would run about 160 to 180 lbs. per I.H.P. We, of course, are not unaware of the fact that under ordinary cruising conditions, the weight of machinery of naval vessels is apparently higher per I.H.P. than is stated; but we are assuming that full power is always being developed. An unsatisfactory feature in the published data of H.M. ships is the misleading and incorrect information connected with speed and consumption. Would-be naval critics write and talk glibly enough about "coal endurance" and "radius of action;" these two phrases are harmless, if misleading, but like *fin-de-siècle*, they are for the most part used by people who like to be thought up to date. Coal endurance and radius of action are expressed in

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the official tests in terms of bunker capacity and distance that can be steamed at 10 knots. To the uninitiated this is very valuable information, and so it is not surprising that we read in the newspapers that such and such a vessel could steam out to the West Indies without re-coaling.

To make our point clear, we will give a few examples. The unarmoured cruiser *Edgar* is intended for high speed. She has to rely entirely upon her speed, both for offence and defence. Her protection consists of an armoured deck only. She may usefully be compared, *for this purpose only*, with an Atlantic liner. She is 360 × 60 × 23′ 9″, and displaces 7,350 tons. With natural draught she indicated 10,170 I.H.P., at 99 revs. The speed being 19¼ knots, and with forced draught 12,463 I.H.P. with 104·5 revs. The speed being 21 knots. Although this performance has been exceeded by her on another occasion, we are justified in saying that she can be relied upon to develop 12,000 I.H.P., which will give a speed of 20 knots. Now, for this speed to be really effective it must be maintained for long periods; this implies great "coal endurance." We refer to the official list and find that the *Edgar* can stow 850 tons of coal in her bunkers. Now this vessel has 868·25 sq. ft. of grate area, and allowing 20 lbs. of coal per hour per sq. ft. of area, and taking the power as 10,170 under natural draught, and the speed as 19¼ knots, we see that she could steam for 4·6 days at this speed, and cover 2,125 miles; in other words, she could hardly reach Halifax from Plymouth. With forced draught she would burn 40 lbs. or more per sq. ft. of grate. If she burns 40 lbs. and develops 12,500 I.H.P., the speed would be 21 knots. She could now steam for 2·3 days, and would cover 1,159 miles.

It tells as nothing that the *Edgar* has a radius of action of 10,000 miles at 10 knots speed. We do not want warships to emulate the performances of an East coast tramp-steamer. But we require a fast cruiser to be able to make a voyage of at least a week in duration at full speed. This, of course, implies size. There is a comfortable fiction in vogue to the effect that full speed would only be required for a few hours. Really the evidence which justifies this has never been satisfactory to us. If Nelson, in his wind-jammers, had to chase Villeneuve twice across the Atlantic, we reasonably conclude that speed and great coal endurance now replace the valuable sailing quality known as "ability to carry sail." How useful in warfare a

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vessel would be which could not maintain the speed of a fast mail-steamer for more than 2¼ days is a question that naval tacticians must settle. A locomotive which could develop a speed of 70 miles per hour, but which required to be rebunkered every half hour, would not be regarded as good railroad practice. It may, we think, be laid down as a principle in design for cruisers, that high speed must always be associated with great coal endurance.

Closely allied with the question of coal endurance is that of bunkering arrangements. In the Merchant Service we are so accustomed to great yawning chasms easily filled with coal that we can hardly appreciate the difficulties which surround this question in the Navy. It may be laid down as another principle that good sub-division and bunkering arrangements are impossible of association. Many try to meet the views of the naval architect and the engineer, but with the most complete failure. Any arrangement which will give the former proper and efficient sub-division is of necessity detrimental to that continuance and perennial flow of coal so beloved by the engineer. The former contrives ingenious arrangement of "flats," "pockets," "wing passages," and elaborate strange things in the shape of water-tight doors. The engineer entertains a hearty and not ill-founded objection to cells, &c., and regards water-tight doors with suspicion. Trimming in the Navy is, as might be imagined, terribly hard work, as it has to be carried on in small spaces, and owing to the various bulkheads, &c., the labour of getting the coal to the fires is very great. It is said that in some of H.M. ships full speed cannot be maintained for very long periods, owing to the inability to get the coal to the furnaces. In action the difficulty would be enhanced, as all water-proof doors, manholes, &c., would be closed, and how the coal would be trimmed it is impossible to say. This difficulty with the bunker arrangements can only be surmounted by the adoption of some other kind of fuel.

From coal to boilers is a natural step. So much has been written and said about Navy boilers that it might be supposed the subject was exhausted. Really, the "battle of the boilers" is only commencing. Much ill-natured and ignorant criticism about naval boilers has appeared of late, and we have had the *Vulcan*, *Thunderer*, and *Osborne* held up as awful examples of Admiralty bungling and waste of taxpayers' money.

Here for the present we leave the subject, but hope shortly to return to it.

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SOME CAUSES OF MARINE CASUALTIES.

IT is matter for sincere congratulation that the total number of shipping casualties deemed deserving of more searching investigation by the Board of Trade remains almost stationary from year to year, especially when we remember that British merchant ships afloat are being continually added to with unexampled rapidity, and that modern ships make many more passages during their checkered careers than was possible in the old sailing-ship age. A careful analysis of such inquiries, held at home ports as recorded in "Our Official Log" during the twelve months of 1891, clearly shows that although many mishaps may occur around our coasts to carrying craft under the British flag, yet few are of sufficiently serious a nature to call for special treatment before properly qualified tribunals. Neglect of the lead in foggy weather when making or leaving the land, a marked tendency in officers of steam cargo carriers to shave outlying dangers in all weathers far too closely, and carelessness in applying one or other of the articles pertaining to the Rule of the Road, are as usual the principal causes which lead to the suspension of masters' and deck officers' certificates for periods varying with the nature of the case. Sophocles sang of that peculiar power displayed by the human race in rendering the elements subservient to their will, and his first illustration is happily inspired by the supreme skill and high-souled daring of navigators. Little he imagined, even in his wildest flights of poetic fancy, that the time would come when huge sailing-ships, carrying deadweight cargoes of from 3,000 to 6,000 tons over many a league of stormy sea, would be handled by scanty crews averaging about 15 men per 1,000 tons register! The British flag is on every sea, nevertheless disaster is much more rare than might legitimately be expected. Rudyard Kipling, in his recent ode to the flag that braved a thousand years the battle and the breeze, puts the following well chosen words into a stirring address made by the personified west wind to ingrates at home who yelp at the British flag:—

"In squadrons the thoughtless galleons fly,
That bear the wheat and cattle lest street-bred people die.
They make my might their porter, they make my house their path,
And I loose my neck from their service and whelm them all in my wrath.

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But whether in calm or wrack-wreath, whether by dark or day,
I heave them whole to the conger or rip their plates away,
First of the scattered legions, under a shrieking sky,
Dipping between the rollers, the English flag goes by."

An army officer, leading a forlorn hope to storm a fort, has the satisfaction of knowing that the eyes of the whole civilised world are upon him, the officer in charge of a warship is somewhat similarly situated; but masters of the Merchant Service perform deeds of valour every day against the forces of nature arrayed against them. Too often records of these daring deeds are written in sand, but the few misfortunes are carved indelibly in marble. The merchant service does not consist entirely of splendid steamships belonging to first-class companies, as some would have us believe, but includes all sorts and conditions of carrying craft. Steam has induced shipmasters to push boldness into reprehensible recklessness occasionally in hugging headlands, for it must be borne in mind that even the very best of charts is not an infallible guide, and an uncharted rock is a nasty thing to try conclusions with when in such nearness to the land as a prudent navigator would shun. There is an old adage, that it is well to steer for a rock if you wish to keep clear of it, but when too near the land an unknown danger might easily be located by a too confident navigator running his ship thereon in broad daylight. A barquentine, the *Minnia*, ran ashore on the coast of Brazil because her master kept away for a boat supposed to contain a pilot, despite the fact that his sailing directions distinctly stated that pilots never ventured outside the port. The steamship *Derwentwater* came to grief because her second officer curiously mistook the light of Cape Finisterre for that of an approaching steamer. His certificate was rightly suspended for twelve months. Downright carelessness has something to do with shipping casualties at times. The steamship *Delta* stranded near Heligoland one clear day, and the certificates of master and mate were suspended for twelve and six months respectively. Another steamer, the *Marbella*, went ashore on the well-lit coast of Spain when the land was plainly visible and the weather fine. Her master left only the most meagre verbal instructions upon going below, and did not come on deck again when called on two separate occasions. The mate left in charge of her deck mistook a light shedding forth its warning rays, and simply allowed her to strand without concerning himself further in the matter. Similarly

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the mate of the steamship *Dee* actually noticed her going on shore, but neglected every precaution, and gave no warning whatever to the master. Again, the steamer *California* went ashore while running along the land near Oruba in charge of her third officer, who was utterly unacquainted with the coast, and failed to appreciate the danger into which his vessel was standing. Her master was on deck, but asleep in a chair, being worn out by previous protracted duty, and it would appear that a quartermaster, sent by the third officer to arouse the master, had been unsuccessful. Obey orders, even if you break owners, is an unwritten law at sea which is more honoured in the breach than in the observance. It is an old sailor's expressive manner of stating that, inasmuch as his opinions and experience are despised, he will in future let things take their own course, even when he is well aware that danger threatens. Officers snubbed by their superiors for evincing too much zeal are apt to carry this dangerous principle into practice with disastrous results to all concerned, and this may be the cause of some otherwise unaccountable strandings and collisions. Better for a young officer to call the master too often at the risk of slight censure than to dally with danger until too late. Neglect of the lead in one ship may indirectly bring misfortune upon another more carefully navigated vessel. For example, the steamship *Charles* went to the bottom near Harrington in consequence of neglect to heave the lead in hazy weather. Next day the steamer *Broughshane* came along on the same track, struck this submerged danger, and also sank. The steamship *Elemore* was navigated through a North Sea fishing fleet at full speed and ran down one of the boats. It was proved beyond a doubt that she was without a look-out, no signal to stand-by had been given to the engine-room, and her chief engineer at this critical time had left the donkeyman in charge. The only wonder is that more fishermen did not suffer by such an unseamanlike method of navigating in narrow waters. A Newcastle steamship, the *Critic*, when bound from New York to Leith, collided with a large iceberg, much to the surprise of all on board. Her chief officer had heedlessly left the bridge to assist the men of his watch in their ordinary routine work about the decks, and at the instant of collision her helmsman was the only person suitably placed for observing approaching dangers. Her square foresail was set so that he could not see right ahead, and thus steered directly on to the

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icy mass which lay in the steamer's track. An able seaman asserted in his evidence that an officer was never known to remain on the bridge of the *Critic* except in thick weather. This mate had his certificate suspended for six months because he had permitted the bridge to be deserted. It is difficult to understand in what way a young officer, whose living is dependent upon continuity of employment, could evade a master's orders, either expressed or implied, that his officers should leave the bridge and work with the watch in fine weather. Many steamships are similarly mismanaged, especially under the command of masters who have grown old in sailing-ships. Instances are not far to seek where this most dangerous practice has been followed, even on board steamers owned by firms utterly opposed to it. If anyone be to blame in a short-handed steamer when an officer leaves the bridge tenantless in order to perform other duties, then let punishment be visited upon the master. He is the person solely responsible and monarch of all he surveys. His subordinates would not dare to vacate the bridge for any purpose whatsoever if they were certain that by so doing the righteous indignation of the master would be visited upon them. Let it be made clear that power has its responsibilities as well as its privileges; but, should an officer leave his post to trim a sail, scrub paintwork, or for any cause, against the written orders of his superior, then that offending officer's certificate should be most severely treated. Otherwise let the master be deemed cognizant of such dereliction of duty and dealt with accordingly; for implicit obedience is a virtue at sea, and an officer should not be punished for leaving the bridge under circumstances over which he can have no control and frequently against his better judgment. A fine sailing-ship, the *Balmoral*, was cast away near Johnshaven while homeward bound from Calcutta with a valuable cargo of jute for Dundee. Her master had been promoted to this ship in consequence of sterling seamanship displayed in navigating the barque *Lyra* round Cape Horn to Queenstown, under jury-masts. She had been dismasted one month after leaving Pisagua, when about 350 miles off Valparaiso, but was brought home without putting into any port on the way. The mate of the *Balmoral* was a sleeping partner in her navigation; the master made a simple slip in the arithmetical part of his calculations which vitiated his position to the extent of five miles. His working was unchecked, and so the

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Balmoral went ashore in foggy weather. This one man navigation has many objections, and but little if anything can be urged in favour of its adoption or retention. That man alone is free from making mistakes who never does any work; and even a shipmaster after the microscopically minute, but utterly undesirable arithmetical accuracy of a Board of Trade examination, will not infrequently be put to shame if he rely entirely on his own calculations. The London Shipmasters' Society officials are altogether opposed to such an affectation of infallibility by a shipmaster of the Mercantile Marine. The steamship *General Elliot* was badly dealt with by that well-known current off Cape Finisterre; and the *Batley* was likewise troubled by the indraft into the Bay of Biscay. Another steamer, the *Trent*, struck on a rock not marked on the small scale chart by which she was navigated; and the *St. Donat* stranded on a shoal in the Black Sea which was shown in position on the Admiralty chart for that part, but not on the one used by her master. The steamship *Dunmurry* capsized in the North Atlantic owing to her bulk cargo of grain having shifted, and eight lives were lost. Shipmasters of to-day should be familiar with the principle underlying the use of ballast tanks and stability in general. At a critical moment the wheel chain of a steamship parted, and a collision ensued with another, that foundered with all hands. The *Whitehall*, which would probably have been in about that position when the collision took place is missing, and a trawler has brought to the surface some wreckage supposed to have belonged to her. In another case, that of the steamer *Carrier*, a link in the steam-steering gear broke, and the hand gear became jammed while connecting it. The sailing-ship *Ellen A. Reed*, of 1,750 tons register, met with a sad accident when in 50° S. 47° W., homeward bound from Tacoma to Bristol with a cargo of grain. A link in her outer bobstay parted, causing the jibboom to snap short off and the three topgallant-masts to go over the side. A man was on each skysail-yard at that instant stowing the skysails, which had just been taken in, and all three men were drowned, despite every effort made to save them. No fewer than four steamships were adjudged to be undermanned, but there was not a single instance of an unseaworthy ship, and it is gratifying to find that in no case was drunkenness of master or officer the cause of disaster. This fact speaks volumes in favour of the hard-worked officers of the many and various ships of our Mercantile Marine.

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Casualties to ships, concerning which inquiries have been held at home ports during the period embraced by the twelve numbers of this Magazine for 1891, may fairly be classed under the following heads:—Neglect of the lead; negligent navigation; stress of weather; collision; erroneous inferences with respect to lights, soundings, tides, and currents; explosion; foundering; fire; and unknown dangers. Forty-one vessels were incautiously navigated; 21 came to grief by neglect of the lead; 18 suffered through stress of weather; there were 14 cases of collision affecting 28 ships; 9 were endangered by erroneous inferences with respect to lights and currents; 4 struck unknown submerged dangers; 1 was burnt; 1 was damaged by an explosion caused by coal gas coming into contact with a naked light; and 1 ship has not been heard of since leaving England. Not one of these ships was proved to have been faulty in construction or overladen. Thirty-one of them were coal laden; 25 were in ballast; 19 had general cargoes; 15 carried timber; 12 grain; 10 various metals and ores; 4 nitrate; 4 cotton; 2 manure; 1 salt; 1 oil; 1 herrings; 1 fruit; 1 cement; and 1 sugar. The ages of the vessels concerned were as follows:—

Years old ...	0-9	10-19	20-29	30-39	40-49	Not stated.
Number of Ships	58	87	16	5	2	10

Some of the masters were merely cautioned, others were censured, and one had his certificate suspended for 18 months; but six months of disgrace seems the usual decision. Masters must never forget that it is wiser to err on the side of caution; for saving a tide, or prompt delivery of mails, cannot be weighed in a balance against human life, and excessive eagerness to make a passage may mean professional ruin.

Similar inquiries held at ports abroad slightly exceed in number those of home ports, and are of a somewhat more serious nature, as may be gleaned from the pertinent fact that no fewer than four masters had their certificates cancelled. In one case, the schooner *Perseverance* was prematurely abandoned, for, although her foremast had gone, she might easily have been towed into port if her master had accepted the services of a passing steamer, which were offered but refused. In a second case, the master of the barque *Earn* kept no record of her position, navigated by old unreliable charts, and abandoned his vessel without just cause. A third master navigated the barque *Raven* on similar want of principle, with like results

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to ship and shipmaster. Last, but not least, was the splendid sailing-ship *Craigburn*, lost near Port Phillip Heads, in consequence of acts of omission and commission on the part of her master and mate. The former had his certificate cancelled; the latter paid the penalty of drunkenness with his life. Her master was also compelled to pay £25 towards defraying the court expenses, and unfortunately four other lives were sacrificed. Men seldom become thorough-paced drunkards in an instant, and it seems probable that a rigid scrutiny by shipowners or their representatives would effectually weed out the few objectionable characters that still offer their services to command or officer a valuable ship at an inferior rate of pay to the detriment of reliable men. The barque *Ellen* affords another startling example of terrible suffering, loss of life, and destruction of property, caused by the drunkenness of a responsible officer. She was bound from Newcastle, N.S.W., to Noumea, when a gale arose at a time when her master was below, laid up by an accident, and her first mate drunk and incapable. She was laid-to under improper canvas at the commencement of the breeze, and eventually abandoned by her crew of ten men, who were huddled up in a small boat without water and in possession of only a scanty supply of food. The captain became insane and died; the steward followed within a few hours. Soon after a heavy sea swept two men out of the boat, and three seamen went mad through drinking salt water, and jumped overboard to a watery grave. The few stricken survivors had been nine days without a drop of fresh water, and two days without a morsel to eat when the land was made. Only one man escaped from the savage surf to tell the tale. An iron barque, of 800 tons register, the *Compadre*, bound from Calcutta to Chili, was burnt through the spontaneous combustion of her jute cargo, every aperture leading to her hold was closed and she was kept away for New Zealand, but a storm drove her on to the Auckland Islands. The doomed ship was well alight, so that her crew lost all their belongings. A small store of provisions is left upon these uninhabited islands by the British Government for the sustenance of any castaways that may reach them; so that the crew of the *Compadre* providentially discovered a few tins of biscuits and a dozen small tins of preserved meat. They eked out this scanty stock by the aid of sea birds, seals, and similar makeshifts, on which they existed 100 days, dwelling in an old hut. At the expiration of

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this succession of leaden-footed hours, the schooner *Janet Ramsay* hove in sight, observed the signals flying on shore, rescued the crew, and carried them to New Zealand. A brigantine, the *Eastward*, lost all her fresh water during a gale of wind; her master landed on the coast of Brazil to obtain some more, but being unable to return to his vessel she was beached by the mate in order to save the lives of her crew, and the court of inquiry held him blameless. The steamer *Rothesay* tried to enter Galle without a pilot, notwithstanding the prohibitory advice of sailing directions, and she struck on Matamada Rock. Cross bearings had been taken, but not used, and her master's certificate was suspended for twelve months. A sailing-ship, the *Joseph H. Scammell*, went ashore near Port Phillip owing to the neglect of the lead and omission to signal for a pilot after daylight. Her master was fined 100 guineas, and lost his certificate for twelve months. A collision took place in Madura Strait between two steamships, the *Devonhurst* and the *Strathendrick*, and the latter sank. Both vessels were deemed blameworthy, inasmuch as the mate of the *Devonhurst* broke Art. 16, and the second mate of the *Strathendrick* failed to comply with the provisions of Art. 18. The former officer had his certificate taken away for two years and the latter for three months. In a collision between the steamship *Fairfield* and H.M.S. *Hecla*, the latter was held in fault. Our readers will remember the collision between the steamship *Utopia* and H.M.S. *Anson* in Gibraltar Bay, when, owing to an unfortunate error of judgment on the part of the Mercantile Marine commander, 600 lives were lost. The *Utopia*, threading her way through a crowded anchorage in inclement weather, drifted across the death-dealing ram of the *Anson*, and sank almost instantaneously. A tank steamer, the *Pollux*, was left to her fate in the North Atlantic with rudder carried away, leaking badly, and her fires put out by the rising water. She had been sighted by the *Michigan*, in a sad condition, on 28th November, 1890, but her master would not be prevailed upon to desert his ship, which drifted about in a helpless condition, until 29th December, when her crew was rescued by the *State of Nevada*, in 54° N. 21° W. An error of five miles in position laid down on working chart, due to a simple slip in calculation, was partly the cause of the stranding of the steamship *Coventina;* but there was also careless navigation, bringing censure to both master and mate. The steamship

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Transition struck some floating substance and received damage. Two sailing-ships, the *Andora* and the *Sir R. Fernie*, and a steamship, the *Clan Drummond*, were in collision at one time in the River Hooghly owing to an error of judgment. A large sailer, the *Bruce*, capsized by accident while shifting to her loading berth in New York Harbour. The ship *Indore* and the barque *Callirhoe* collided in the Hooghly in consequence of the carrying away of the barque's wheel-rope. A steamship, the *Clan Mackay*, met with misfortune owing to her steering gear jamming. The brigantine *Meg Merrilies* was in trouble at the New Hebrides and also at the Solomon Group. Her master was fined eight guineas to defray costs, and his certificate suspended for six months. Three sailing-ships, the *Riversdale*, the *Loch Naw*, and the *Ayrshire*, went on the reefs of New Caledonia. Their charts and sailing directions were not sufficiently accurate to ensure safety, and uncharted reefs exist in that locality. A well-found sailing-ship, the *Marlborough*, left a New Zealand port for London, laden with frozen meat; she was spoken when two days out, but not a vestige of her has since been seen. Two other similarly laden sailing-ships subsequently disappeared while homeward bound along the same route. Of 127 shipping casualties inquired into at ports abroad 24 were due to collisions, in which 49 ships were concerned, 27 to reckless navigation, 24 to stress of weather, 11 to erroneous inferences, 10 to neglect of the lead, 5 to fire, 5 to the use of unreliable charts, 17 to accident; 3 vessels have not been heard of since leaving the land many months ago, and 1 was unseaworthy. The last-mentioned vessel was a small coaster of the West Indies, so that, practically, not one sea-going carrying craft proved incapable of keeping the sea out of the 237 inquiries, numbered from 4,171 to 4,407, both numbers inclusive; and navigation is far from being as risky as some people assert. "We trust our lives to seamen," said Thackeray, "and how nobly they fulfil their trust."

METEOR.

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THE "LUX" DISASTER.

IT is a regrettable feature of the bulk petroleum trade that it has been so far accompanied by a series of disasters, which have not unnaturally created considerable prejudice in the minds of the authorities and of the public against it. We have, on previous occasions, declared that no explosion has yet occurred on board ship which was not the result either of bad structural arrangements or of ignorance on the part of those who handle these vessels. The more we analyse the various reports which follow the official inquiries, the more convinced we are of the urgent necessity for measures being taken to see that those who design, construct and handle petroleum-in-bulk steamers should prove their competence before some technical body. The lamentable want of knowledge of petroleotechnics displayed by the masters and officers of these vessels is fully equalled by those who "design" them. This is abundantly manifest by a consideration of the report of the official inquiry on the loss of the tanker *Lux*. This vessel was a steamer designed for the transport of petroleum in bulk. While carrying a cargo of refined oil from Batoum to Antwerp, and when in the Grecian seas, she caught fire and eventually stranded, and it is surmised blew up, as one or two explosions occurred. The loss of life was very serious—out of a complement of 26 but 6 were saved. The disaster occurred on November 2nd, 1891. The report is dated March 5th, and was issued to the public on June 2nd, or, only seven months after the event occurred—a gratifying instance of official procrastination. The report is a considerable improvement upon former ones of a similar nature, and forms a useful contribution to the literature of the subject. We cannot, however, say that it is distinguished for its scientific and technical analysis of the subject; on the contrary, this quality is practically absent. Indeed, we do not think that the constitution of the Courts, or the professional attainments of the members, in this particular branch of applied science, are such as to produce anything better than a general review of the case more from a popular than from a scientific and technical point of view.

The *Lux* was designed and built by Messrs. Armstrong, Mitchell & Co., of Newcastle-on-Tyne, who have made this

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branch of naval construction a special industry, and we regret we are unable to congratulate them on their results. The *Lux* was 250′ 0″ (B. P.) × 35′ 2″ × 23′ 11½″. When drawing 19 ft. she displaced about 3,300 tons. She was a spar-decked vessel, with the machinery placed aft between the after-peak bulkhead and the two bulkheads before the boilers, which thus formed an ordinary cross bunker. The foremost bulkhead extended from the floor plates the full section of the vessel to the spar deck. It had on it two doors, placed one on each side, the sills of which were about 4 ins. above the main-deck. The after bulkhead of this bunker was fitted with two bunker doors at its foot, opening on to the stokehold. So far the arrangements were such as are found in most steamers, and therefore are doubtless considered the most suitable for petroleum vessels; the hold space was divided into tanks by means of eight transverse and one longitudinal bulkhead. We need not discuss the detail any further than to say the arrangement of the tanks was unsatisfactory. We will confine our attention to the aftermost tank. The main-deck formed the tops of the tanks in the sides, but the middle space was occupied by a trunkway extending throughout the 'tween-decks, from the main-deck to the spar-deck. The top of the trunkway was plated over and fitted with a hinged hatch for each separate tank. The object of the trunkway was to provide an expansion chamber for the oil, and also to obtain a small free area, so that when but partially filled, the motion of the vessel would not be productive of any motion in the oil. We should also say that this trunkway was of rectangular section. Between the forward cross-bunker bulkhead and the aftermost tank bulkhead was a space about 2 ft. in length, extending the full width of the ship as high as the main-deck, forming what is termed erroneously a "coffer dam," the purpose of which is that when filled with water it forms a wall between the tank and the bunkers, and any leakage into it is floated up, and should be by suitable means dealt with. As petroleum is, however, a dangerous cargo, it is hardly necessary to say that the coffer dam, or, as we prefer to term it, the "insulating space," is usually kept empty, because any leakage into it will generate explosive vapours; it also forms a convenient bo'sun's locker, for paints, &c.; besides, does it not, when filled with water, represent so much non-freight earning displacement? We must ask the reader to follow carefully the following, as without a drawing it is difficult to grasp the arrangement. The fore cross-bunker

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bulkhead was carried up, as we have said, the full width of the ship to the spar-deck. The two doors in it open on to the main-deck, which here meets it. The trunkway begins at the same bulkhead; two feet of this trunkway forms the upper part of the coffer dam. Now, the space on each side of the trunkway between the main and spar-decks was utilised as bunkers, the coal being worked through the doors in the bulkhead into the cross-bunker, then shot down the bunker hatches, where it was shovelled through the doors in the after cross-bunker bulkhead. This description is, we admit, tedious, but it is necessary to give it so as to fully appreciate the stupid and fatal design. Now, in designing a tanker, the guiding principle is to arrange so that oil cannot under any reasonable contingency reach the furnaces. Therefore, we always find in all petroleum steamers the boilers placed as low down as possible, and with as many facilities provided as skill and ingenuity can suggest for a ready flow of oil to them. This was carefully done in the *Lux*, and is, indeed, a feature of every tanker yet built. The *Lux* was a well-built vessel, and the workmanship was very good. She was, of course, classed at one or the other of the many register societies (so, by the way, was the *Chippewa*). Classification is to ships what "respectability" is to the poor but honest toiler,—a virtue which it costs little to enjoy, and under the cloak of which many curious things are possible. A contingency to be provided against in a tanker is leakage, and leakage will occur when the strength of the structure is unable to withstand the stresses set up in it or with defective riveting. Now, when the disaster occurred, the *Lux* was fully laden, and she was encountering the heavy short seas which are so common to the Mediterranean, and which are far more trying to a vessel than the long waves of the Atlantic.

She had space for 2,200 tons of oil, of ·825 Sp. Gr. With this amount, the space allowed for expansion was 1¼ per cent. We are not inclined to place any credence upon the theory that the insufficient expansion space was in any way a cause of the disaster, as there was no rise in temperature; on the contrary, there was a fall of several degrees, which would produce a decreased volume in the oil. She loaded up at Batoum with 2,229 tons of refined oil, and when in the Doro Channel, in very heavy weather, it was discovered that there was a fire in the port bilges. On taking off the side hatches leading to the port bunker the flames shot up with violence,

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evidently pointing to the presence of a furious fire below. The vessel was abandoned and drifted ashore in flames, and as two explosions were heard, it is thought she eventually blew up; 20 persons lost their lives. The evidence disclosed that a leakage occurred in the trunkway of a very extensive nature. The oil ran along the port 'tween-decks, and then flowed through the door into the cross-bunker, it then flowed down the hatch, through the bunker doors on to the stokehold floor, where the ignition of small coal saturated with oil was a natural consequence. Of course, once such a fire occurred, the vessel was doomed. Probably the cross-bunker took fire and the after-tank of oil, heated, overflowed, and the vapour mixed with the air, being in presence of flame, exploded. The fire in the stokehold must have surrounded the boilers, and steam was rapidly generated faster than it could get away through the safety valves, the stop valves were closed; eventually one or both boilers exploded. Whether this sequel of events is or is not correct is immaterial. Two distinct explosions were heard. Thus a valuable vessel and cargo and many lives were lost, not by any direct act or default of those in charge, but by errors in the general design. The two principal features of the case are the means which existed for preventing the oil reaching the furnace, and the means employed for ensuring the necessary strength in the hull and its component parts. We have seen that, so far from the oil being prevented from reaching the stokehold, everything was apparently done by the builders to ensure that it should get there. The boilers were placed forward of the machinery, low down, and on the same level as the bunker floor. They should have been placed high up and abaft the machinery. The coffer dam was rendered useless, by the fact that the space between the fore cross-bunker bulkhead and the after-tank bulkhead did not extend the full width of the ship. Had this coffer dam or insulating space been properly arranged and kept filled with water, any leakage from the trunk would have remained in the 'tween-deck. Then it will be said, how are the coals to be worked from the 'tween-decks to the bunker? Anyway, the most suitable, but under no circumstances must the efficiency of the insulating space be sacrificed. In the *Lux*, as we have seen, a passage-way was expressly provided for the coal, and where coal can be worked, petroleum will find its way. In fact, the arrangement of the coffer dam and the passage-ways in the *Lux* was absolutely fatal to the proper segregation of

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the oil. We are told that in some more recent vessels, built by the same firm, a passage-way through the coffer dam, closed by watertight doors, has been built. We can only say that we hope none of our readers will ever have the misfortune to sail in these "later types." We are also told that the same firm has, in these same "later types," carried up the coffer dams to the spar-deck, and "fitted them with tanks and watertight doors." Now, if there is one thing more delusive than another it is a watertight door. We say that there should be no such death-traps in any vessel, but more especially in petroleum steamers. The report does certainly allude to these defects in the designs of the firm in question, but instead of denouncing in unmistakable language the utter and lamentable ignorance of the principles of designing petroleum steamers thus exhibited it expresses its pleasure (!) to learn that these stupid blunders, or, as it states euphoneously, "fundamental defects," have been rectified in the "later types." We sincerely hope so, for the sake of the men who will sail them. In other respects, the *Lux* was unfit for her intended service. The pumping arrangements were incomplete: there was no "sumpt" or well into which any possible leakage into the bunker could be collected. There was no proper means for dealing with any possible leakage on the main-deck. The system of working the vessel was also singularly inefficient: there were no daily surveys made of the tanks and coffer dams, no tank log was kept, and no proper record of temperature. Coming to the second leading feature, we see the design and construction of the trunkway was all that could be desired, if we regard it as merely forming a receptacle for the oil and not as an integral part of the structure of the vessel. If, however, we regard it in the latter light, it is apparent that it was not capable of contributing much of anything to the strength of the hull. The design of the hull and the disposition of the cargo was such that when loaded abnormal strains were introduced. Here we must ask why the report does not contain the curves of displacement or buoyancy and weight per unit length? Why, too, are there no curves given illustrating the nature and amount of the various tensile and compressive stresses set up in the vessel when among waves. Without this information it is impossible to adequately discuss the question of efficient design. The Board of Trade Inspectors have thus greatly minimised the value of their report. Had the longitudinal trunkway been designed and constructed

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as a hollow girder, a great increase in local and structural strength would have resulted, and so built, the vessel would have been enormously, but not excessively, strong. Instead of this we find a trunkway 130 ft. long, 17 ft. wide, and 6 ft. 9 ins. deep, composed of $\frac{5}{16}$ in. plates in the top and bottom, and $\frac{6}{16}$ in. plates in the sides, stiffened by angles spaced 24 ins. between centres. In fact, this trunkway added nothing to the strength of the hull. Such a structure obviously possessed no ability to resist distortion. The method of joining what was virtually the top and bottom members with the webs was wholly insufficient. We are unable to accept the view put forward by the report that the trunk would be more liable to leakage than the hull, because it receives no support from the external water, and because the play of the oil in it is greater. The trunk, as an expansion chamber, was sufficiently strong; as an integral part of ship's structure, liable to be strained, it was lamentably weak. It, in fact, was unable to withstand the strains communicated to it by an already weak hull. The continual rocking at length started a seam, the oil poured out, and the catastrophe was soon accomplished. It is to be regretted that the report is silent upon the question as to whether the hull and trunkway were well designed for the purpose they had to fulfil. We have no hesitation in saying that the thin plating, the improper method of connection at the angles, the absence of longitudinal strength, and the absence of diagonal braces between the top and bottom members rendered such a structure wholly unfit and unsuitable. The report concludes with this observation:—"That the design of the vessel, and to some extent her arrangement and discipline, failed in more than one particular to satisfy the conditions of safety." We have no hesitation in thoroughly endorsing this finding. We should point out, in conclusion, that the "type" of which the *Lux* is an awful example has many other representatives. At the time of writing, we hear of the loss, by explosion, of the petroleum steamer *Petrolea* at Bordeaux. This vessel is the sister ship to the *Tancarville* on which a disastrous explosion occurred at Newport in April, 1891. We trust that these awful disasters will convince shipowners and the Board of Trade that the development of modern trade and the varying conditions under which our commerce is carried on, require the employment of men as masters and officers who are a good deal more than mere

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ocean carriers. So far as the petroleum industry is concerned, the sooner this truism is recognised and acted upon, the better.

GEO. HERBERT LITTLE, Assoc. M.I.N.A.

Liverpool.

BASIC STEEL FOR SHIPBUILDING.

A PAPER read by Mr. W. H. White, the Director of Naval Construction at the recent meetings of the Iron and Steel Institute, brings with it the conclusion that a further step has been taken in the use of steel for shipbuilding. This appears at first sight impossible, it being a well-known fact that nearly all the ships now built are of steel. It is, however, necessary to remember that there are several kinds of mild steel, or, rather, several processes used in the manufacture of mild steel, and it is only steel made by certain of these processes which hitherto has been considered a suitable material for ship and boiler construction. There are first the two leading divisions of steel as manufactured in the Bessemer converter and in the Siemens-Martin or open-hearth process, according to the method used originally in each process. The earthy lining of the converter or other vessel constructed to hold the molten steel was silicious, and for this reason it was impossible to use pig-iron containing phosphorus. By the subsequent invention of Messrs. Thomas & Gilchrist, a lining was used consisting of magnesian limestone, and steel manufactured in this way is known as *basic*, being thus distinguished from the *acid* steel of the old process. The great proportion of pig-iron made from English ores contains phosphorus, and is thus unsuitable for steel making, either by the acid Bessemer or the acid open-hearth process; hence the great advantage of the basic process to this country, not merely from a pecuniary point of view, but also as securing an important manufacture from risks brought about by international complications.

While basic steel has been manufactured largely for rails and for other purposes, it has up to the present been considered unreliable for ship or boiler work. Some seven years ago it

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was employed in some mercantile shipbuilding, but the results were very unsatisfactory, and no attempt has been made to use it in England since that period for merchant ships. On the Continent, however, it has been successfully employed; but it is said that, although the Continental steel has been manufactured by the basic process, phosphoric pig has not been used in the manufacture, and hence it is a superior article to the basic steel made from ordinary English pig.

Mr. White's paper describes the recent connection of the Admiralty with the basic steel question. In March, 1886, Mr. Percy Gilchrist, the surviving inventor of the new process, approached the Admiralty with a view to a searching investigation into the qualities of basic steel. Six manufacturing firms gave facilities for Admiralty officers to visit their works and to select samples for testing from plates made both by the Bessemer and open-hearth methods. From that time to the present the experiments have been proceeding. At first the manufacturers desired that their steel should be expected to stand a minimum tensile strain of 23 or 24 tons, the Admiralty limit for ordinary steel for shipbuilding being 26 tons. The idea was not, of course, that steel at 23 tons was as valuable as reliable steel at 26, but that if the former could be produced more cheaply it might be desirable to use it in spite of the extra thickness which would be required to secure an equally strong structure. In fact, the idea of the steelmakers at that time was that, although they could not produce a material equal to acid steel, they could manufacture a metal occupying an immediate position between acid steel and iron; and if in a steel ship the scantlings were reduced 20 per cent. as compared with iron, they might be reduced, say, 10 per cent., for the metal of intermediate character. Something like this has been done by Bureau Veritas for some time past. Ordinary iron used for mercantile shipbuilding has not been subject to a rigorous system of tests such as are applied to steel. Bureau Veritas, however, have subjected what they designate "iron of superior quality" to a system of tests similar to the steel tests; and they have three tables of scantlings, one for steel, one for ordinary iron, and an intermediate table for "iron of superior quality." The latter has, however, we believe never been asked for in the case of any ship built in England.

Neither Lloyd's nor the Admiralty appear to have entertained the idea of establishing provisions for steel of a lower quality than that hitherto used. The former, doubtless, would require

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that a new material should be produced in such quantities as to have a really commercial importance before they could make special provision for it. Mr. White tells us that the Admiralty consider it a necessity for war-ships, built on comparatively light scantlings, that for the maintenance of both strength and stiffness the minimum tensile strength hitherto existing should be maintained. Upon this, the basic steel manufacturers set to work to produce reliable steel which should meet existing Admiralty requirements, and in this they have now attained a considerable measure of success. In 1887, the Admiralty placed a small trial order for basic plates and bars, which were used in some of the less important parts of some ships building at Chatham, and were favourably reported on. As the result of this, it was decided provisionally to place basic steel in the same position as Bessemer acid steel. It is here necessary for for us to explain that the Admiralty procedure with regard to acid steel has in one important respect differed from that of Lloyd's. The latter are contented if steel passes the prescribed tests, and accept it on the same terms, whether it is made by the Bessemer or open-hearth system. The Admiralty, on the other hand, have from the first been more favourably inclined to open-hearth steel than to Bessemer steel, and have laid down rules by which the latter is only used in the less important parts of the ship's structure. The step, then, was to place basic steel with the class of material admitted for the less important parts of the structure of the ship.

A further series of experiments was then undertaken to ascertain the effect of riveting upon the new material. The Admiralty have always attached considerable importance to tests of this nature, and it is upon results derived from them that they have discriminated between open-hearth steel and Bessemer steel. Mr. White tells us that frequently specimens of Bessemer steel proved equal to specimens of open-hearth steel in tensile, percussive and forge tests, in capacity for welding, and in the loss of strength consequent on punching; but when riveted samples were tested—the plates from which those samples were cut being the same that had been used in the previous series of experiments—the Bessemer acid steel proved inferior to, and much less trustworthy than, the open-hearth steel. Repeated experiments confirmed this conclusion, and hence arose the existing regulations. In the series of experiments initiated in 1888, Bessemer basic steel was tried, and satisfactory results were not obtained, but Mr.

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White thinks that on the whole they were not below the results usually obtained from acid Bessemer steel. In further experiments, open-hearth basic has been tried. No advantage would be gained by following Mr. White in the details of the tests, and it will be sufficient to quote his summary of the results. Material has been tested as supplied from various parts of the country and by different makers, and thus the results do not depend upon the exceptionally favourable manipulation of one firm. Conclusive evidence has been obtained, that the basic process applied by competent makers to the production of open-hearth steel may be trusted to give results no less satisfactory than those obtained from acid open-hearth steel. "With these results before them," Mr. White states that "the Admiralty have decided to admit basic steel made in the open-hearth on practically the same terms as regards ship work, as those on which acid open-hearth steel has been admitted. The new process will, no doubt, have to be carefully watched, in order that uniformly good results may be obtained."

"It will be noticed," remarks Mr. White, in conclusion, "that the paper has dealt exclusively with basic steel for shipbuilding purposes. It is the Admiralty practice to gain experience of a new material for ship work before considering its adoption for boiler-making. This was done when mild steel was introduced, and the same course is still being followed. For boiler tubes, however, basic open-hearth steel is already admitted by the Admiralty."

There is, however, a further point in connection with the question which does not appear to be quite settled by Mr. White's paper, and that is, whether the basic steel supplied to the Admiralty has been made from ordinary pig-iron containing the usual percentage of phosphorus or from selected pig. In other words, is it practicable to make satisfactory ship steel from the ordinary Cleveland pig. Mr. Martell, who spoke in the discussion following Mr. White's paper, appears to think not. He says Lloyd's had some satisfactory acquaintance with the frames of a ship which were made from basic steel, produced by the open-hearth process from pig, containing 1·5 per cent. of phosphorus, but utter failure had resulted in plates made from pig with 3 per cent. of phosphorus. Lloyd's now are admitting foreign basic steel which is made from pig containing a very small percentage of phosphorus. To this Sir Lowthian Bell, who is an undoubted

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authority on the question of steel manufacture, replied that the pig in his district only contained 1½ to 1¾ per cent. of phosphorus; but the real difficulty was not affected by the quantity of phosphorus, it being easy to get rid of large quantities of the impurity, whereas the real difficulty occurs in removing the last trace of it.

Whether this view be correct or not will soon be proved. The Admiralty regulations will give basic steel a fair trial, and if steel-makers can succeed in regularly producing an article which will satisfy the Admiralty, its use must in time extend to the Mercantile Marine.

ADMIRALTY SURVEYS.

THE following is an abstract of the most important parts of the Hydrographer's "Report on Admiralty Surveys," recently published as a Parliamentary Paper. These surveys were made during the year 1891.

Ten ships were engaged on hydrographical surveys at home and abroad, and with regard to these surveys the Hydrographer significantly remarks that—

"During the year 1891 the Hydrographic Department has received information of 121 new dangers of the most formidable class, viz., *small submerged rocky patches which are difficult to find.* Of these, 31 rocks were reported by H.M. surveying vessels; 10 rocks by other of H.M. ships; 14 by various British and foreign vessels; 22 were brought to light by vessels striking on them; and 42 were reported by colonial and foreign Governments. The fact that a new rock was found in the area traversed by a large part of the enormous trade of Liverpool is a convincing proof, if one were needed, of the difficulty of feeling certain that all hidden rocks have been brought to light, even in surveyed and much-navigated waters."

The Report then proceeds to record, in detail, the work done by the various surveying vessels :—

"*England, South Coast*; *Ireland, North Coast*; *Scotland, West Coast.*—H.M.S. *Research*, Captain Hon. Foley C. P. Vereker, determined, off Ventnor, a running distance in deep water for steam trials of deep-draught swift ships. A re-examination of the Shingles Bank in the Needles Channel was next undertaken; much alteration was here found to have taken place since the last Admiralty survey in 1881, the bank having extended southward and westward. Proceeding to Brownsea

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Road, Poole Harbour, a re-examination of the Swash Channel and bar leading into the harbour, showed that a good deal of alteration had taken place since 1878, when previously sounded.

"The *Research* next proceeded to Exmouth, and there continued the survey of the mouth of the River Exe; subsequently sailing for the north coast of Ireland for the purpose of obtaining more accurate off-shore soundings in the approach to the northern shores of Ireland. Finally a new survey of Oban Bay and its approaches, on 10 ins. to the nautical mile, was made.

"*England, East Coast.*—H.M.S. *Triton*, commanded by Staff-Captain T. H. Tizard, began surveying operations on the estuary of the Thames, and made a re-examination of the Duke of Edinburgh Channel in consequence of shoaler water having been found on the Shingles Patch in October, 1890. The result proved that the Shingles Patch was still increasing in size, its extent being within the five fathoms line, a little over one mile in length and four cables in breadth, the least depth on the patch was 19 ft., precisely what it was in October, 1890. Opportunity was also taken to examine the Tongue Knoll, and the east end of Margate Sand. Both were found to extend considerably farther east than when last surveyed, necessitating a re-arrangement of the buoyage and an alteration in the *red* arc of the North Foreland Lighthouse.

"Shortly afterwards the vessel proceeded to the River Tyne. Here a survey on 10 ins. to the nautical mile was executed of that part of the river from Howden seaward to three-quarters of a mile eastward of the entrance. The breakwaters are approaching completion, and their success is very apparent when it is considered that the bar of this river, which used only to carry six ft. of water, has now a depth of over 30 ft. at low tide.

"Making a survey of the River Tees, on 10 ins. to the nautical mile, it was found that the outer bar of the Tees carries a least depth of 16 ft. at low water, that a depth of 10 ft. at low water could be carried up to Middlesbrough, that the shoal water off the north entrance point had extended considerably, and that a bank had been formed off it with a depth of 18 ft. at low water.

"From the Tees the *Triton* proceeded to the Wash, and surveyed Freeman Channel, a passage recently widened through the sands between Boston and Lynn deeps. A depth of 10 ft. at low water was found in this channel, which is now buoyed and lighted. Boston bar was found to have altered its direction completely, trending more to the southward over a place where formerly the sand dried at low water. The new channel across the bar is more tortuous and narrow than the former passage, and has no greater depth in it than 10 ft. at low water.

"*Scotland, West Coast; Wales.*—The *Knight Errant*, a hired steam-vessel, under the command of Staff-Commander W. E. Archdeacon, commenced surveying operations on the West Coast of Scotland, making a very close survey of Lamlash Harbour in Arran Island, and also of

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Campbellton Loch on the east side of the peninsula of Cantyre, Argyllshire. Lamlash has of late years been resorted to by large squadrons of H.M. ships, and it was therefore desirable to define the limits of anchorage for large ships with accuracy. The survey was therefore carried out on a large scale, and the results showed that the work had not been undertaken too soon, as in the harbour itself not only had the northern part shallowed, but a pinnacle rock with 33 ft. over it and 10 to 15 fathoms close round it, unknown even to local fishermen, was discovered in the middle of the anchorage.

"Off Holy Island an extensive gravel bank was found to extend nearly half a mile from its south point, with several coralline knobs on it, having 28 to 31 ft. over them. Other, but deeper, rocky patches were discovered on the east side of Holy Island.

"Commenced a very close survey on a large scale of the Skerries Channel and north coast of Anglesea from Carmel Head eastward to Llanliana Head. This important locality in the fairway to Liverpool is studded with dangers and foul ground, and as ships navigate closer and closer every year it was deemed desirable to have the whole locality more minutely examined than was necessary when the former survey was made. The strength of the tides, and the rips they raise over rough bottom, prevent such a survey making more than slow progress, as it is impossible to sound with any accuracy except with a moderate stream. In spite of the monotony of such a survey and the positive danger to which the ship was constantly exposed, the whole ground was minutely examined, and while it would be rash to say that no more heads exist, Staff-Commander Archdeacon and his officers had the satisfaction of finding a new and isolated danger on which it seems somewhat extraordinary that no vessel has struck. This is a small rock, three and a-half miles eastward of the Skerries, and one and a-half miles from the land, with only 20 feet on it at low water springs, which lies very much in the track of ships using the channel between the Skerries and the shore. This danger was promptly buoyed by the Trinity House. Several shoal heads of 4½ fathoms were also discovered in the Skerries Channel, and owing to the great velocity of the tidal streams very dangerous rips were experienced, especially off Carmel Head, in the vicinity of which, during south-west gales, with the ebb tide, small deep-laden craft have been known to founder.

"*Nova Scotia (Halifax); Newfoundland, South Coast; Labrador (Belle Isle Strait).*—Staff-Commander W. Tooker and his staff were employed on the survey of the outer portion of Halifax Harbour, completing the coast line from Sandwich Point to Chebucto Head, and also soundings seaward to the Portuguese Shoal. The *Gulnare* left Halifax for the south coast of Newfoundland, and 10 days were spent in the vicinity locally known as Burgeo Bank, where an area of about 10 miles north and south by 15 east and west was closely sounded, but the least water found was 27 fathoms over a patch of small stones and shells

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half a mile in extent. The soundings obtained proved that the western portion of this bank was more extensive than marked on the existing charts, the 50-fathoms contour line being eight miles farther to the south-west. Six weeks were afterwards spent in Belle Isle Strait, when the vessel returned to the south coast of Newfoundland, advantage was taken when in the vicinity of Rich Point to disprove the existence of two rocky shoals off that point, said to have two and three fathoms respectively over them. Depths of 40 to 90 fathoms were obtained around the reported positions, and no indications of shoal water were observed. These two shoals have been removed from the Admiralty charts. The soundings taken off Rich Point revealed a rocky bank about two cables in extent within the 10-fathoms line, with a least depth of seven fathoms lying one mile S. 70° W. (true) from the point.

"*Red Sea; Seychelles; Africa, East Coast.*—H.M.S. *Stork*, commanded by Lieutenant Smyth, surveyed in the southern part of the Red Sea, between Mohabbakah Islands and the Straits of Babel-Mandeb. This survey was undertaken with a view of ascertaining whether the route for steam-vessels passing west of Hanish Islands is safe for navigation. The peculiar difficulties of a survey in this region are that, except for a very brief period in every year, either the wind is so strong or the haze so thick as to make work impossible, or the heat is so great as to try the most zealous very severely. The non-existence of the shoal reported by the commander of the British steamship *Tagus* in 1889, to lie in 13° 1′ N., 43° 1¼′ E., 2½ miles eastward of Scilla shoals, was proved. This would have been a serious addition to the dangers of this route, but Lieutenant Smyth's examination shows, that with ordinary care, this track may be safely followed in daylight, even in hazy weather.

"A bank of some extent, having 12 fathoms least water, was found 4½ miles northward of Balfe Point, Perim Island. The existence of this may, at times, prove of service to vessels when approaching that island from the north during thick weather, as the general depth around is over 20 fathoms.

"During September, the ship was actively engaged sounding over the rim of Seychelles Bank from Dennis Island to the westward and southward for 150 miles. The result of the preliminary lines of soundings confirm the supposition grounded on the few casts heretofore obtained, that there is a nearly continuous rim of more or less shallow water extending along the whole of the western part of this great bank, and show that caution inculcates that it should not be crossed north of 5° S. latitude. The great Seychelles bank is probably the largest submerged atoll in the world, having a perimeter of 500 miles.

"*Red Sea.*—H.M.S. *Rambler*, Commander L. S. Dawson, left Hong Kong on 14th February for England, via Suez Canal. It was, however, deemed necessary to detain her for some weeks in the southern part of the Red Sea to examine the projected route for vessels west of the

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Hanish Islands, a task which was shared by the *Stork*, which worked south of the Mohabbakah Islands, while the *Rambler* took the northern side. The space embraced by the soundings covered an area of about 650 square miles, in which no new dangers were found. The *Rambler* was more especially directed to examine the edge of the bank which skirts the deep central gutter, as it is in such positions that small coral patches are not infrequently found. No indication was, however, discovered, but the area is so large and the difficulty of finding such rocks is so great that ships have been warned to keep in the deeper water of the centre of the sea.

"A search was also made for a patch of 16 fathoms charted to the southward of Jebel Teir and west of Zebayir Islands, in latitude 15° 12′ N., longitude 41° 44′ E., but the depths obtained over and near the spot averaged from 32 to 42 fathoms.

"*China, Borneo, Singapore.*—H.M.S. *Egeria*, under the command of Commander A. M. Field, proceeded direct to Vereker Bank, situated 45 miles north-westward of Pratas Island, China Sea, where a fortnight was spent in making a close examination of the locality, with a view to discover whether any small dangerous patch existed on this recently found bank. The *Egeria's* soundings, although failing to discover anything less on Vereker Bank than 35 fathoms, revealed the fact that a second but smaller bank existed three miles to the S.W., upon which a least depth of 32 fathoms was found, in latitude 20° 58′ N., longitude 115° 55′ 30″ E. In the Sulu Sea, one day was devoted to an examination of the Pasig Shoal, and another day to sounding over and near the position upon which the Spanish schooner *Rosalia* was reported to have been lost in 1867. The search for Rosalia Reef was made under favourable circumstances of weather, without a trace of any irregularity in the bottom, over an area of 200 square miles, in depths between 1,100 and 1,200 fathoms. Memnon Bank, reported by the British steamship *Memnon* in 1889, was also sounded over and its limits defined. It was found within the 100-fathoms line to be about 8 miles long in an east and west direction, with a breadth of 1¼ miles, rising from depths of 190 to 200 fathoms, having 8 fathoms least water; the bottom throughout being live coral with patches of sand.

"*Australia, North-West Coast.*—H.M.S. *Penguin*, Commander W. U. Moore, went to Bezout Island, near Cossack, and made a more detailed examination of the area of *magnetic disturbance*, situated two miles from Bezout Island. Briefly, the result of this further examination is as follows:—Within the limits defined of an area four miles long, N.E. and S.W., by two miles broad, with a depth of eight to nine fathoms at low water spring tides, the compass is disturbed from 1° at the outer limits to as much as 56° near the focus of the disturbing force. Over this focus the dip needle showed 81° 10′ S., the north-seeking end being thus repelled upwards 81°; the greatest range in deflection of the *Penguin's* compass was 86°, viz., 56° to the east and 30° to the west.

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These magnetic observations by the *Penguin* corroborate the results of previous inquiry into local magnetic disturbance, viz., that in the southern hemisphere the north-seeking end of the needle is repelled by the disturbing force, while in the northern it is attracted. There is nothing, however, in the observations to lead to the opinion that any danger accrues to navigation in this locality except that a vessel steering by compass across the area of disturbance would be set out of her course, more or less, according whether she cut across it at the narrowest part or obliquely.

"The *Penguin*, when returning to Baudin Island from Roebuck Bay, defined Balein Bank and surveyed a small area to the west of it. This bank, whose position was hitherto doubtful, is situated 75 miles northward of Roebuck Bay, and lies in the direct track of vessels navigating this coast. Expedition Island placed on the chart of 1865, in lat. 15° 34′ S., long. 128° 45¾′ E., on the authority of the master of the barque *Tien Tsin*, was found not to exist; the *Penguin* anchoring in 35 fathoms in the above position assigned to the centre of the island. Indications of a shoal were found three miles to the west and north-west of the position, but no land or sand-bank was visible from the topgallant-masthead at low water neap tide. Consequent on this search Expedition Island has been removed from the Admiralty charts.

"An unsuccessful search was made during three days, under favourable conditions of sea, for the reef supposed to be in lat. 18° 35′ S., long. 125° 13′ E. An area extending about 10 miles around this position was sounded over, but no trace of shoal water was observed, the depths obtained were 30 to 45 fathoms over an even bottom consisting generally of coral sand, and shells. This reef has accordingly been expunged from the Admiralty charts. The general result of the *Penguin's* two years' survey of the maze of reefs, banks and channels north of Capes Voltaire and Bougainville is somewhat disappointing as regards the prospect of shortening the route between ports and ensuring safety. Some reefs placed on the charts by the first explorers had been cleared away. On the other hand, many new rocks and shoals have been discovered, which lie in the direct route of ships bound from Port Darwin or Wyndham to Derby or Roebuck Bay, by both the inner and outer routes. The water for 30 or 40 miles from the land is thickly impregnated with lime and mud, so that objects three feet below the surface are not visible. The *Penguin* has on two or three occasions narrowly escaped stranding on hitherto unknown rocks from this cause. The range of tide is large, 20 to 25 ft., and the tidal streams consequently strong. For these reasons the locality must always be navigated by large vessels with great caution, and it seems probable that the quickest and safest passages will be by making the long detour round the Holothuria Bank, at any rate, until beacons, buoys and lights are placed, which are at present out of the question.

"The locality, 180 miles northward of Port Darwin, where Captain Flinders in 1803 found a coral bank of seven fathoms, and also the

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bank in the same vicinity, with 11 to 15 fathoms on it, discovered by Captain Blackwood, of H.M. ship *Fly*, were examined in close detail, with the result that four isolated banks (two being new) were found with from five to seven fathoms water over them, in the direct track of ships bound from Port Darwin to Hong Kong. These four banks appear to be but a portion of a submerged coral barrier.

"Water of a depth of over 2,000 fathoms was found over and around the position of the doubtful Bahia reef, Molucca Passage, which laid in the fairway of traffic between Amboina and Hong Kong. This bugbear to navigation has at length been erased from the Admiralty charts, with a fair certainty that it does not exist.

"*Queensland.*—The Colonial gunboat *Paluma*, under the command of Lieut. G. Pirie, visited Thursday Island for the purpose of searching for the reported sunken reef said to lie in the Prince of Wales Channel about five miles westward from Quoin Point, Goode Island. A careful examination of the assigned area failed to detect any indications of a reef. When returning to Cooktown the localities of five reported dangers—Pearn Reef, Erlangen Patch, Tannadice Shoal, Dugdale Rock, and a shoal 5½ miles north of Lizard Island, all near the track of steam-vessels using the inner route — were sounded over, but only the Erlangen Patch and Dugdale Rock were found. Their positions were accurately determined. From abreast of Chapman Island, near Cape Direction, the *Paluma* passed through a channel close inside the outer barrier reef to a point 16 miles north-westward of Cape Melville, in order to ascertain whether it would be safe, as an alternative and much shorter route, than that now followed along the coast. The result showed that detailed examination would first be necessary.

"*Tasmania; New Hebrides.*—H.M.S. *Dart*, commanded by Lieutenant G. C. Frederick, left Sydney for Tasmania. On the way a week was spent in Bass Strait, searching for a rock on which it was supposed the barque *Carlisle* had struck on the night of 6th August, 1890, to the southward of Moncœur Islands. A close search over the position given by the master of the *Carlisle*, and that which most nearly agreed with the reported bearings, failed to show any indication of shoal water, the bottom being very even and the soundings agreeing with those already on the chart. In all probability the *Carlisle* struck upon the well-known danger, Crocodile Rock. Proceeding to the New Hebrides, the survey was commenced of the islands between Efate and Api (including the south coast of Api) on a scale of one inch to the nautical mile. During the progress of this work no new dangers were discovered, but the incorrect positions of these islands, as shown on existing charts from old sketch surveys, proved the necessity of the work being undertaken in the interests of navigation.

"*India.*—The west shore of the Bay of Bengal was under survey, and a new plan of Coconada, one of the most important anchorages on that coast, was made. A re-survey of the Lakadive islands was commenced,

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as some of the islands are reported to be erroneously placed on the chart to the extent of from three to six miles. A small plan, on a scale of three inches to a nautical mile, of Minikoi Island was made. The rock off Mirissi Point, south coast of Ceylon, on which the *City of Venice* was said to have struck, was not found; and the fishermen of the locality knew nothing of any danger near the assigned position. Deogarh harbour on the Konkan coast was surveyed, and large scale plans of Verawal and Jafarabad, on the Kathiawar coast, were executed.

"*Summary of the Publications of the Hydrographic Department in* 1891.—As regards *Charts*, 80 new charts and plans have been published, and 18 plates improved by 27 new plans; 59 worn plates have been partially re-engraved; 4,038 corrections have been made to plates by the engraver; 178 plates have been largely improved by corrections and additions; 31,089 charts have received minor corrections by the draughtsman; and the number of charts printed for official requirements and to meet the demands of the general public amounted to 287,198.

"There were published 644 *Notices to Mariners*, and seven *Hydrographic Notices*.

"Of *Books*, 26 volumes and pamphlets were published relating to sailing directions and other important hydrographical works, and 24 volumes and pamphlets were in progress."

HONOURS NAUTICAL ASTRONOMY, 1892.

THE Nautical Astronomy paper placed before the candidates presenting themselves at the last May examination of the Science and Art Department was, as usual, well qualified to test the attainments of those concerned. It goes without saying that the sea is the only school for seamen; nevertheless, we understand that a very small percentage of the competitors in this important subject have had any nautical training. Shipmasters and deck officers nowadays require to be something more than riggers or boatswains, lest they sink into sorry insignificance; and it behoves them to keep pace with the educational movement, by availing themselves of the advantages afforded by the Science and Art Department in the subjects pertaining to a navigator's training. Passages have to be made now to the nearest second, and to this end an increased acquaintance with the theory and practice of Navigation and Nautical Astronomy is of the first importance. Old-time mariners, coasting carefully from headland to headland, were wont to

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draw their clumsy craft on to the nearest beach when night was nigh and about to spread her sable mantle over the well-known features of hill and dale. To lose sight of those lonely landmarks meant expatriation, if not dire destruction; and Homer has left us a vivid word picture of the navigators following the coast, or steering by the scintillating stars on clear nights, who always hailed with delight the morning light, "the rosy-fingered dawn." Dryden has expressed this fact in felicitous terms :—

> "Rude as their ships was navigation then,
> No useful compass or meridian known;
> Coasting, they kept the land within their ken,
> And knew no north but when the Pole-star shone."

Astronomy has done much to make the navigator's path across the trackless main a certainty. Sir J. Herschel remarked that "every well determined star, from the moment its place is registered, becomes to the astronomer, the geographer, the navigator, the surveyor, a point of departure which can never deceive or fail him, the same for ever and in all places, of a delicacy so extreme as to be a test for every instrument yet invented by man, yet equally adapted for the most ordinary purposes; as available for regulating a town clock as for conducting a navy to the Indies, as effective for mapping down the intricacies of a petty barony as for adjusting the boundaries of trans-Atlantic empires."

In the First Stage, or Elementary Examination, there were six theoretical, and six practical questions; but not more than four out of each section might be attempted. Definitions of altitude, azimuth, amplitude, meridian, hour angle, and right ascension of a heavenly body were called for together with diagrams in illustration thereof. A knowledge of sextant and chronometer was necessary; but the maximum number of marks was allotted to "prove the rule for finding the variation of the compass by an amplitude observation." Here is a very simple proof not generally known. In the general spherical triangle we have $\sin \delta = \sin h \sin \phi + \cos h \cos \phi \cos A$, where δ, h, ϕ, A, represent declination, altitude, latitude, and azimuth respectively. In the particular case of amplitude $h = o$, $\sin h = o$, $\cos h = 1$, and the equation becomes $\sin \delta = \cos \phi \cos A = \cos \phi \sin$ Amp., or, as more frequently written, sin Amp. = sin dec sec lat. The practical part would have been plain sailing for the experienced navigator to whom theory might have proved a stumbling block, inasmuch as simple examples

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of latitude, longitude, and azimuth problems were given. Candidates in the Second Stage, or Advanced Examination, were confronted with eight more difficult questions, all or any of which might be attempted, including latitude by reduction to the meridian, longitude by lunar, a double altitude, and several searching theoretical questions. The Honours Paper was well up to the mark, and demanded from those attempting it a somewhat intimate acquaintance with the whole subject. It opened with an easy question, carrying a rather large number of marks. "41. Explain what is meant by the equation of equal altitudes, and investigate formula for calculating it." The equation of equal altitudes is a correction which has to be applied to the mean of the chronometer times of the equal altitudes in order to obtain the exact time of transit. If the sun's declination were constant, this correction would be unnecessary, as in that case the meridian would bisect the angle at the pole, formed by the declination circles of the sun, when he has equal altitudes east and west of meridian. To find the equation we have $\sin h = \sin \delta \sin \phi + \cos \delta \cos \phi \cos T = \cos p \sin \phi + \sin p \cos \phi \cos T$, and differentiating with respect to p and T regarding h and ϕ as constants we get $o = (-\sin p \sin \phi + \cos p \cos \phi \cos T)\, dp - \sin p \cos \phi \sin T\, dT$. Let P be the elevated pole, Z the zenith, X the place of the sun, and δ his declination when the first observation is taken, then $\cos h \cos X = \sin p \sin \phi - \cos p \cos \phi \cos T$ and $\cos \phi \sin T = -\cos h \sin X$. Substituting these values in the first and second terms respectively of the right-hand side of the first equation we have $\sin p \cos h \sin X\, dT = \cos h \cos X\, dp$ and $\therefore\ dT = \frac{\cos h \cos X}{\cos h \sin X \sin p}\, dp = \cot X \sec \delta\, dp$. This formula must be divided by 15 to reduce it to seconds of time, and the equation of equal altitudes $= \sec \delta \cot P X Z \left(\frac{\text{change in P. D.}}{15}\right)$. Other forms of this correction may readily be found. That usually given is obtained directly from the equation $o = (-\sin p \sin \phi + \cos p \cos \phi \cos T)\, dp - \sin p \cos \phi \sin T\, dT$ which may be written $dT = dp \frac{\cos p \cos \phi \cos T - \sin p \sin \phi}{\sin p \cos \phi \sin T} = dp$ (cot p cot T $-$ tan ϕ cosec T) $= dp$ (tan δ cot T $-$ tan ϕ cosec T). The next question was the time honoured lunar which we would submit might be omitted with advantage, and its place taken by an example of the use of Burdwood's and other tables in rapidly

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finding azimuth and position. "42. May 2nd, 1892, at $4^h\ 30^m$ p.m. mean time nearly, in latitude 40° N. and longitude by account 135° W., the following lunar observation was taken:—

Obs. Alt.	Obs. Alt.	Obs. dist.
Sun's L.L.	Moon's L.L.	N.L.
26° 25′ 54″	66° 45′ 0″	81° 4′ 14″

Ind. Cor. 2 10 − 1 30 +

The height of the eye was 19 feet. Required the longitude."

A similar question was given in the Advanced Paper, which we proceed to solve by means of the given auxiliary angle, and check by the direct method. "May 2nd, 1892, the mean time at ship was $4^h\ 30^m$ p.m., when a lunar observation was taken, from which the following results were obtained:—

	App. Alt.	True Alt.	
Sun	26° 35′ 21″	26° 33′ 33″	App. dist.
Moon	66 57 53	67 19 36	81° 3′ 24″

Auxiliary angle A = 60° 29′ 0″. Find the true distance, and thence determine the longitude." Let z, Z, be true zenith distances; h, H, apparent altitudes; d, D, apparent and true lunar distances; A the auxiliary angle always obtainable from the formula $2 \cos A = \frac{\sin z \sin Z}{\cos h \cos H} = \sin z \sin Z \sec h \sec H$. The formula for finding value of D is vers D = vers $(z + Z)$ + vers $(h + H + A)$ + vers $(h + H \sim A)$ + vers $(d + A)$ + vers $(d \sim A) - 4{,}000{,}000$. In Fig. 1 let Z = zenith; O R = horizon; s, m, apparent positions of sun and moon; S, M, corresponding true positions; $s\ m = d$; S M = D. First in triangle $s\ m$ Z there are given Z s, Z m, $s\ m$, to find angle s Z m, which being accomplished there are known in triangle S M Z the two sides Z M, Z S, and the included angle Z to find S M, just as though finding the great circle distance between S and M. For simplicity sake we have lettered the sides a, b, c, and the angle at zenith A. Now $\tan^2 \frac{A}{2} = \frac{\sin (s - b) \sin (s - c)}{\sin s \sin (s - a)}$ in triangle $s\ m$ Z; and D = a

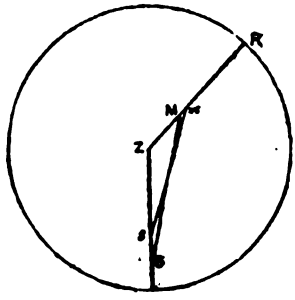

Fig. 1.

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in triangle S M Z is easiest found by using auxiliary angle θ.

z	68°	26′	27″	
Z	22	40	24	
$z + Z$	86	6	51	$v.$ 22314
d	81	8	24	
A	60	29	0	
$d + A$	149	32	24	$v.$ 30425
$d - A$	20	34	24	$v.$ 37768
h	26	35	21	
H	66	57	58	
$h + H + A$	154	2	14	$v.$ 90786
$h + H \sim A$	33	4	14	$v.$ 20008
D	80	48	2	$v.$ 01801

$\text{Tan } \theta = \text{tan } b^1 \text{ cos A}$

Tan b^1	9·62093
Cos A n	9·86503
Tan θ n	9·48596

$\therefore \theta = 162° 58′ 38″$

By Direct Method.

a	81°	8′	24″		
b	28	2	7	b^1	22° 40′ 24″
c	68	24	39	c^1	68 26 27
$2s$	167	30	10		
s	83	45	5	cosec	0·00259
$s - a$	2	41	41	cosec	1·82777
$s - b$	60	42	58	sin	9·94061
$s - c$	20	20	26	sin	9·54108

$\text{Tan}^2 \frac{A}{2}$ 0·81205

$\text{Tan } \frac{A}{2}$ 0·40603

$\therefore \frac{A}{2} = 63° 33′ 51″$

$A = 127 7 42$

$\text{Cos } a = \frac{\text{cos } b^1 \text{ cos } (c^1 - \theta)}{\text{cos } \theta}$

Cos b^1	9·96507
Cos $(c^1 - \theta)$ n	9·21925
Sec θ n	0·01946
Cos a	9·20378

$\therefore a = D = 80° 48′ 2″$

In using versines it is waste of time to take out more than the five last figures from the tables, and the true distance will always be found in the same column as the apparent distance, or in the adjoining column, of course remembering that we have only the five last figures of the result. The letter n prefixed to logarithms in direct method indicates that the numbers to which they correspond are to have the negative sign. Question 43 was: "Find the corresponding error in the hour angle (1) for a small error in altitude; (2) for a small error in latitude." To find the error in hour angle corresponding to small error in altitude, we will start from the fundamental formula $\sin h = \sin \delta \sin \phi + \cos \delta \cos \phi \cos T$, and differentiating with respect to h and T we get $\cos h \, dh = -\cos \delta \cos \phi \sin T \, dT$, whence $\frac{dT}{dh} = -\frac{\cos h}{\cos \delta \cos \phi \sin T}$ but $-\cos \delta \sin T = \cos h \sin A$ and we may write

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$d\,T = d\,h \frac{1}{\cos\phi \sin A}$ or small difference in hour angle = small difference in altitude × sec lat. × cosec azimuth. Now the latitude is constant, so that the error in hour angle varies directly as cosecant of azimuth, and consequently is least when azimuth is 90° or the object is on the prime vertical. Again differentiating the fundamental equation with respect to ϕ and T, we get $o = (\sin\delta\cos\phi - \cos\delta\sin\phi\cos T)\,d\phi - \cos\delta\cos\phi\sin T\,dT$, which may be written $o = \cos h \cos A\; d\phi - \cos\delta\cos\phi\sin T\,dT$, because $\cos h \cos A = \sin\delta\cos\phi - \cos\delta\sin\phi\cos T$. Hence $\frac{dT}{d\phi} = \frac{\cos h\cos A}{\cos\delta\cos\phi\sin T} = -\frac{\cos h\cos A}{\cos\phi\cos h\sin A}$ $= -\frac{\cot A}{\cos\phi}$. It will be noticed that the error in hour angle vanishes when cot A = *o*, or, in other words, when the object is on the prime vertical. This was a comparatively easy question to candidates conversant with elementary differential calculus work and the fundamental formulæ of spherical trigonometry. No. 44 was as follows:— "At a certain place, *Sirius* and *Procyon* are observed to rise at the same time; find the difference of their amplitudes at rising, and their azimuth when they are on the same vertical circle." No. 45 was to "Investigate method of finding the true bearing of a terrestrial object by astronomical observations. Detail the purposes for which this problem is found useful." In Fig. 2 let Z be the zenith, S the sun, O the object, altitude of S = *a*, altitude of O = A, and distance between S and O = *d*. From the triangle formed by Z, S, and O, we get $\cos d = \cos Z\,S\cos Z\,O + \sin Z\,S \sin Z\,O\cos Z = \sin a\sin A + \cos a \cos A\cos Z$;

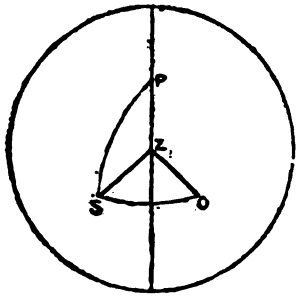

Fig. 2.

and then making $a + A + d = 2s$, we find Z from the formula $\tan^2\frac{1}{2}Z = \frac{\sin(s-a)\sin(s-A)}{\cos s \quad \cos(s-d)}$. Then azimuth of object = Sun's azimuth ± Z. The proper sign to be used with Z in this result is determined by the sun's position with respect to the terrestrial object at time of observation. When object is on the horizon we have A = *o* and $(s - a) = \frac{1}{2}(d - a)$,

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$(s - A) = \frac{1}{2}(d + a)$, $s = \frac{1}{2}(d + a)$, $(s - d) = \frac{1}{2}(a - d)$, and in this particular case $\tan^2 \frac{1}{2} Z = \frac{\sin \frac{1}{2}(d - a) \sin \frac{1}{2}(d + a)}{\cos \frac{1}{2}(a - d) \cos \frac{1}{2}(d + a)} =$ $\tan \frac{1}{2}(d - a) \tan \frac{1}{2}(d + a)$. This problem is more especially useful to the nautical surveyor, inasmuch as a line drawn through the object and the place of observation serves as a fixed direction to which he can refer all the parts of the horizon. No. 46 was a question involving both theory and practice. "September 6th, 1892, in longitude 8° 16′ W., the observed maximum altitude of the moon's L.L. was 28° 21′ 35″, zenith north of moon, ind. cor. − 2′ 0″, height of the eye 20 ft. (1.) On the supposition that this observed altitude is the meridian altitude, find the latitude. (2.) As a matter of fact, the maximum altitude occurred $5^m\ 52^s$ after the meridian passage. What amount of error in the latitude is introduced by considering the maximum altitude as the meridian altitude? Explain why it is that there is a difference between these two altitudes. (3.) Explain why it is that there is only one meridian passage given in the Nautical Almanac for this day." The first and third part of this question demand no special knowledge from the practical navigator. A heavenly body culminates in the neighbourhood of the meridian when its declination is variable and at a distance from the meridian, which varies with the rapidity of movement in declination. Again starting with the fundamental formula so often requisitioned, $\sin h = \sin \delta \sin \phi + \cos \delta \cos \phi \cos T$, and differentiating it with respect to h, δ, T, we get $\cos h\, dh = (\cos \delta \sin \phi - \sin \delta \cos \phi \cos T)\, d\delta - \cos \delta \cos \phi \sin T\, dT$; but at moment of culmination movement in altitude is nil, so that $dh = o$, and dividing by $\cos \delta \cos \phi$, the equation becomes $o = (\tan \phi - \tan \delta \cos T)\, d\delta - \sin T\, dT$, and therefore $\sin T = (\tan \phi - \tan \delta \cos T) \frac{d\delta}{dT}$. Now T is always very small, so that we may write $\cos T = 1$ and $\sin T = (\tan \phi - \tan \delta) \frac{d\delta}{dT} = \frac{\sin (\phi - \delta)}{\cos \delta \cos \phi} \frac{d\delta}{dT}$. If dT = one second, then $\frac{d\delta}{dT}$ = movement in declination in one second, and this expression gives the time of culmination. When $d\delta = o$, the declination is constant, and it will be seen that $\sin T = o$, and body culminates on the meridian. Similarly when $\delta = \phi$. The moon moving most rapidly, $\frac{d\delta}{dT}$ is less than 0·3″, and

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when movement in declination is maximum, we have $T = 0{\cdot}3'' \tan \phi$. It is evident that the altitude corresponding to the culmination outside of the meridian differs by a negligeable quantity from the meridian altitude. Let D, δ, be the declination; H, h, the altitude at culmination and passage of meridian respectively, then

$$\sin H = \sin D \sin \phi + \cos D \cos \phi \cos T$$
$$= \cos (\phi - D) - 2 \cos D \cos \phi \sin^2 \tfrac{1}{2} T;$$

but T is a very small angle, and therefore $\sin H = \cos (\phi - D)$ or $H = 90^\circ + D - \phi$; for meridian altitude, $T = o$ and $\sin h = \cos (\phi - \delta)$, whence $h = 90^\circ + \delta - \phi$, and therefore $H - h = D - \delta$ or $H = h +$ difference of declination in the small interval of time between the maximum and meridian altitudes. The examiner rightly requires diagrams in several instances to illustrate the analytical work, and we were much pleased to find that such aids to a thorough appreciation of the subject are deemed indispensable by the officer more especially responsible for the tuition of the youngsters on board the United States corvette *Saratoga*, which is employed in the most important service of manufacturing navigators for the Mercantile Marine of her country. A few days ago we visited her at anchor off the foot of Race Street, Philadelphia, preparing to set out on another cruize to Europe, and our esteemed friend, Captain F. M. Green, U.S. Navy, her commander, showed us with just pride the whole of the actual Navigation and Nautical Astronomy papers worked by his young men on leaving the good old ship, after two years' training, to seek their fortunes afloat. The examiners consisted of one officer of the United States Navy, one master of a large steamship, and another master of a clipper sailing-ship. The questions were not one whit less difficult than those of the Advanced Stage of our own Science and Art Examinations, and fashioned on somewhat similar lines. Nevertheless, the first youngster's workings were absolutely free from faults of any kind, and the others gave every evidence of painstaking tuition, which facts speak volumes in favour of sea-going training-ships, and the correct combination of theory and practice. It is not too much to say that ten years of picking-up of unconsidered trifles by a youngster in a ship of our vast merchant fleet would not have been attended with anything like the same satisfactory result. Question 22 of our May Advanced Paper is a good exercise in diagram work. "Define celestial meridians and circles of declination. Draw a figure,

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projecting on the horizon, roughly representing the following:—Latitude of place, 45° N.; longitude, 0; sun's declination, 17° 17′ 30″ N.; time, mean noon; equation of time, $3^m\ 40{\cdot}7^s$, additive to mean time; sidereal time, $3^h\ 7^m\ 6^s$. Insert in the diagram the following:—pole, zenith, equinoctial, celestial meridian of Greenwich, mean sun (M), apparent sun (S), first point of *Aries* (A). Also indicate the position of *Sirius* (R. A. $6^h\ 40^m\ 23^s$, dec. 16° 34′ 12″ S.), drawing its circle of declination. After what interval of mean solar time will *Sirius* be on the meridian?" Let N.E. S.W. in Fig. 3 represent the horizon then the altitude of the elevated pole is equal to latitude of observer, and if P be the pole, then N P = 45° = latitude. By question, longitude is 0, so that N P S is meridian of Greenwich. Time mean noon and mean sun, M is on equator as indicated, while true sun is at S^1 where S^1 T = sun's north declination, and angle S^1 P M = equation of time, of course greatly exaggerated in order to show it. Z is the zenith, W M E the equinoctial. A M the right ascension of the meridian measures sidereal time, and A is first point of Aries. The arc A R measures right ascension of Sirius, and P R is the star's declination circle which produced 16° 34′ 12″ south fixes the position as indicated. No. 26 of the Advanced Paper required the candidates to "Investigate the method of finding the variation of the compass by time azimuth." Let S in Fig. 2 represent the sun; then, in time azimuth, we have given the hour angle S P Z and the sides P S, P Z, to find the azimuth P Z S. We may use Napier's Analogies thus:—

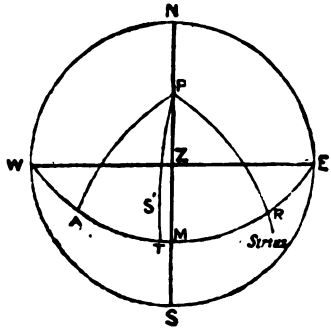

Fig. 3.

$$\text{Tan } \tfrac{1}{2}(Z + S) = \cos \tfrac{1}{2}(p - \phi^1) \sec \tfrac{1}{2}(p + \phi^1) \cot \frac{P}{2}$$

$$\text{Tan } \tfrac{1}{2}(Z - S) = \sin \tfrac{1}{2}(p - \phi^1) \operatorname{cosec} \tfrac{1}{2}(p + \phi^1) \cot \frac{P}{2}$$

whence Z and S can be found, p = polar distance and ϕ^1 = co-latitude. The greater angle is opposite greater side, $\frac{1}{2}(Z + S)$ and $\frac{1}{2}(p + \phi^1)$ are of the same affection, and the azimuth is reckoned from the elevated pole, so that it is of the same name as the latitude. This is the usual method of finding time-

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azimuth, but here also an auxiliary angle may be used with advantage. Let $\tan \theta = \frac{\tan \delta}{\cos P}$, then $\tan Z = \frac{\cos \theta \tan P}{\sin (\varphi - \theta)}$. Auxiliary angles are very useful at times, and Todhunter's "Spherical Trigonometry," one of the most delightful books we have ever read, has an exceptionally clear description thereof which should be pondered over by navigators desirous of attaining a higher intellectual plane. No. 28 called upon those working it to "State the two laws of refraction. Mention the general features of astronomical refraction, and investigate a formula for the calculation of a table of mean refraction." The two laws are as follows:—(1.) The incident and refracted rays are in the same plane as the normal to the refracting surface at the point of incidence. (2.) The sine of the angle of incidence bears a constant ratio to the sine of the angle of refraction for the same medium. Heavenly bodies are raised by atmospheric refraction, and consequently the necessary correction to the apparent altitude is subtractive. Refraction varies with the density of the atmosphere, and hence in delicate discussions it becomes necessary to use supplementary tables which give the corrections to be applied to the usual mean refraction for the observed height of barometer and thermometer. The mean amount of refraction at altitudes of more than about 10° varies very nearly as the cotangent of the altitude, but for altitudes of less than that amount there is an element of doubt in this correction. Refraction is a maximum on the horizon, and vanishes for objects in the zenith of an observer. The maximum refraction is about 34′, so that when the sun's lower limb is apparently on the horizon his upper limb is actually just below the boundary line of sea and sky. Refraction is the cause of the elliptical shape which the sun apparently assumes when setting. Let r = mean refraction expressed in seconds, R = angle of refraction, I = the angle of incidence in Fig. 4. A B is normal at point of incidence C, H C the incident ray, C G refracted ray, G C B = A C F = angle of refraction, F C H = r, A C H = angle of incidence = I = R + r. Then I = R + r and by second

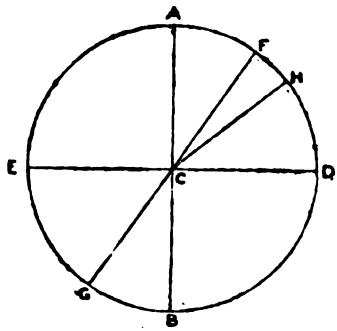

Fig. 4.

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law $\frac{\sin (R + r)}{\sin R}$ = a constant. Therefore sin (R + r) = a constant × sin R; or, sin R cos r + cos R sin r = a constant × sin R. But r is always very small, so that we may write cos r = 1 and sin r = r sin 1″. Therefore sin R + r cos R sin 1″ = constant × sin R and $r = \frac{(\text{constant} - 1) \sin R}{\sin 1'' \quad \cos R} = \frac{\text{constant} - 1}{\sin 1''}$ tan R. For astronomical purposes R may be taken as equal to the zenith dist of the object so that r = constant × tan zenith distance. The constant has been determined, and values allotted to it by various observers. A still more accurate formula is r = 57″·538 tan (zenith distance − 3 r) and this is generally used for calculating table of mean refraction. No. 47 of the Honours Paper was a question on the tides, which we leave to the ingenuity of our readers as a purely book question :—"Describe the construction and use of a tide gauge. Explain why it is that the interval between two tides is greater than 12 hours. What is the average length of this interval? From an inspection of the values given in pp. V.-XII. of Nautical Almanac for September 3rd and September 20th, 1892, state on which of these days the interval between two tides will be the greater, and the reason for your answer. Take from the Nautical Almanac the times of high water at London Bridge for these two days. What is the Establishment of the Port for London Bridge assumed to be? Give the time of high water on September 20th at Hull and Ipswich. What would then be the approximate bearings of the moon at the two places?" The only difficulty in this question was its extreme length. No. 48 was an example of finding true bearing of terrestrial object of which method is investigated in No. 45. "At theodolite X in latitude 54° 3′, the following observation was taken :—Zero − steeple (southward of X) − 360° 0′.

First set with sun's *lower* and *right* limbs.

3^h 58^m p.m.—	35° 10′	alt.	114° 29′
	35 5	,,	114 36
	35 0	,,	114 43

Second set with sun's *upper* and *left* limbs.

4^h 0^m p.m.—	35° 29′	alt.	114° 14′
	35 25	,,	114 21
	35 20	,,	114 28

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Sun's declination 19° 36′ N. Required the true bearing of the steeple from X." Throughout this article, except where otherwise noted, ϕ = latitude, δ = declination, h = altitude, T = hour angle, A = azimuth, p = polar distance, ϕ^1 = co-latitude.

WILLIAM ALLINGHAM.

COMMUNICATION BETWEEN SHIP AND SHORE.

THE proprietors of the *Daily Graphic* newspaper have endeavoured to stimulate invention by offering a prize of £100 "to the inventor of the best means of communicating between a stranded ship and the shore or a boat." Three judges were nominated whose names are sufficient evidence of their ability and impartiality, viz.:—Rear Admiral Seymour, C.B., Captain Vyvyan, R.N.R., Elder Brother of Trinity House, and Captain Wyatt, formerly of the P. and O. Service.

It appears that upwards of 2,000 projects were sent in, and the judges had to spend some time in clearing the ground of absurd and impracticable proposals.

After much sifting and many trials, the judges have arrived at the conclusions following, which we think are of sufficient importance to justify our giving them a permanent record in these pages.

THE AWARD.

"We have, after due consideration, decided in favour of a rocket as the best means of line projection. Among the 165 Ship Rockets that came before us there were many of considerable merit, but we have decided to award the prize of £100 offered by you* to the invention of Messrs. Thomson & Noble, of Southampton. This invention is a grapnel that can be readily and quickly fitted on to the Boxer's Board of Trade life-saving apparatus rocket. The grapnel has arms fitted to it which keep shut closely to its sides during the flight of the rocket, but which, on its touching the ground, open out, and when the line attached to the rocket is hauled on grip the earth, and so secure the line to the shore. This invention provides for the use of either a single line, or of a block and double line rove through it, according to distance and circumstances. We have seen the above rocket grapnel tried more than once. We think it a very great advantage that these grapnels can be fitted to the present Board of Trade rocket for five

* The proprietors of the *Daily Graphic*.

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reasons. First, these rockets are well tried, known, and approved. Second, there is already a large stock of them. Third, the plant for making them is in existence. Fourth, the same may be said of the troughs for firing them. Fifth, the line used with them has been well tested in all ways. We consider that by following the means described in this letter, with the use of Messrs. Thomson & Noble's rocket grapnel, the first part of the conditions of your offer—namely, 'Communicating between a stranded ship and the shore'—may be accomplished with the best possible chance of success under the greatest variety of conditions; and that the same method would throw a line to, or over a boat, which is your second proposition. We also think that this device fulfils the four qualifications mentioned—namely, efficiency, simplicity, portability, and economy, so far as anything now before us, that will really carry out the very important task intended, can be expected to do."

Room for Improvement.

"We have, then, after all awarded the prize not to some entirely new and startling innovation, but to an invention that is to be applied to what may well be called an old friend, namely, the Board of Trade Rocket, and that shall fix it to the shore on landing there. Among our other reasons for so doing is the great consensus of opinions in favour of the use of the *Board of Trade* rocket *from* a ship that has come before us, independently of the actual 165 so-called 'Ship Rocket' inventions; also the great experience of these projectiles that has been acquired, and the facilities now existing for an unlimited supply of them at moderate cost. Yet we must add that we do not think finality is yet nearly reached, and we believe that a rocket and grapnel, both lighter and more satisfactory, would be evolved in the course of properly-conducted experiments. We think that the Board of Trade rocket line is capable of reduction both in size and weight, thereby adding to the length of range, without too much reducing the required strength. Before concluding our report, we desire, in the interests of seamen generally, to record our opinion that circumstances often arise when a light shoulder line-throwing gun, such as those devised by Messrs. Dawson, of Dundee, and Commander J. D'Arcy Irvine, R.N., would be invaluable, and often be the means of saving life by rapidly taking a line to a man overboard, or to a boat adrift or in distress; also for communication between two ships at sea in bad weather. By such means one vessel might take another in tow without lowering a boat, or might be enabled to save lives from a sinking ship, when a boat could hardly live."

An Appeal.

"In conclusion we desire emphatically to remark as follows:—We fully recognise both the humane intention that prompted your philanthropic

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offer and the amount of interest it has so evidently aroused in the public mind, but we earnestly hope the good results will be carried much further than lies in your power or ours. The invention to which we have awarded the prize—even assuming our judgment in doing so to be quite unimpeachable and unquestioned—is probably not the best possible thing of its kind. To find out if it is so, and if not *what* is, should now be seriously attempted. And we venture to suggest, through the medium of your columns, that a small Government grant of money to meet the cost of making a few experiments would be money very well laid out. We would propose the following :—1. That a small committee (but not the undersigned) be authorised to conduct some experiments. 2. That they be empowered to do four things :—1st. To consider if the Boxer's Board of Trade rocket is the best rocket possible to throw a line from the ship, carrying a grapnel with it. 2nd. To make one or more rocket grapnels, as seem to them necessary, for trial. 3rd. That they try these not only to ascertain the best ones for holding, but to find out (*a*) the best distributions of weight for flight and range of the rocket, and (*b*) the best elevations to fire with, under various conditions of wind. 4th. That they consider, try, and report on the best fitments for arranging a rocket tube to be used for firing rockets from different parts of ships, and under varied circumstances ; and the line boxes most suitable for use on board ship with them, as well as the best sort of line to use. We venture to think that this is not too much to ask at the hands of one of the richest nations of the world, and essentially the nation that lives by its sea-borne commerce, by its ships and its sailors, whose mercantile fleet numbers about 15,000 vessels, manned by 204,000 valuable lives, to say nothing of the passengers annually carried under the national flag—a nation the value of whose literally 'floating' capital, or property at sea, on any given day in ships and their cargoes is said to be worth not less than 200 millions sterling—a nation of people who consider themselves as one of the most humane and enlightened in the world. We would ask you, we would ask them, and beg them to ask of themselves, if to perfect as far as may be the means of saving the lives of their seamen when shipwrecked is a thing too extraneous to be expected of England, and too costly for such a nation to perform ?"

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DISCIPLINE.

A WRITER to a contemporary lately fell foul of the Shipping Federation for inserting certain instructions in their benefit books supplied to seamen. A storm in a teacup seems to have been raised anent the matter, but it seems to us that to the true commander of men there is nothing objectionable in the clauses referred to. They run as follows :—

"Whilst due enforcement of discipline and the punishment of offences are strongly urged upon masters by these instructions, at the same time the duty is equally pressed upon them of treating their crews with *consideration and kindness* as well as firmness, thereby encouraging good seamen in well doing."

"As the crew's health and comfort during the voyage is of the first importance, masters should make certain that the forecastles or houses are kept thoroughly clean, and, in sickly climates, limewashed and disinfected; also see that the drinking water used is boiled. Neglect of these precautions has frequently been dearly paid for by prolonged quarantine."

"Chief officers should see that the decks, &c., are washed at as early an hour as practicable, that the greatest regularity is adhered to in the hours for the crew's meals, and that the victuals are well cooked. If no doctor is on board, the chief officer must personally inspect the food when cooked."

The "washing decks" clause seems to have stuck in the gizzards of a good many unthinking officers and masters, and to have unnecessarily stirred up their bile. But it must appear to those who will think for a moment that it is solely for officers and masters incapable of keeping good discipline that these clauses have been framed. No one, surely, will contend that the things mentioned are unnecessary to the well-being of the ship and her crew, and it can only be the neglect of these matters which has caused the Shipping Federation to so prominently bring them to notice. It is to be feared that nine-tenths of the insubordination so often heard of and complained about arises from injudicious ill-treatment of men. We have a large body of officers afloat who have been educated in a bad school, and have neither the will nor the "gumption" to keep good discipline amongst their crew, and at the same time to treat them like men. The writer has in his mind's eye many shipmasters who seldom

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had any trouble with their men, and who, when they did have trouble, dropped on it at once and "nipped it in the bud." These men were strict and never allowed the least familiarity, and yet their crews would follow them anywhere.

The wife of one of these gentlemen was heard on one occasion remonstrating with her husband: "How crossly you speak to those poor sailors! How they must hate you!"

"Hate me!" was the response, "why that very fellow has been about a dozen voyages with me, and if I wanted to get rid of him, I should have to kick him out." Now why was this? The reason is not far to seek. The men under this commander were treated like men, and they simply worshipped him. His ship was a strict one right through, but no injustice was allowed, and though the men knew that the rule was—"Do this and he doeth it, and devilish quick too," yet they also knew that they were properly treated and looked after, and that if they had any legitimate complaint it was rectified at once. Years ago *good* seamen were wont to say for similar reasons that American ships were the best vessels afloat for a *man* to sail in, "But if you didn't know your work, you had better go to h—ll." A voyage in these days is too often begun badly, and goes on from bad to worse. If a master wants to make too much on his subsistence money, and feeds his men *badly*, they have a legitimate cause for complaint at once. If they come aboard and find their forecastle reeking with the dirt of the last crew, they have cause for another growl. If they find a mate who one minute will say—"Here, Jack, got any baccy? Give us a chew," and half-an-hour afterwards will damn the same man up hill and down dale, it is certainly not consistent with the maintenance of good discipline, and yet all these things occur far too often. The truth is, the Shipping Federation have hit the nail on the head, and the adherence to and publicity of their instructions can only do good every way, and we think that only second-rate men will grumble at them.

W.

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ROYAL OBSERVATORY, GREENWICH.

THE Astronomer Royal communicated his Annual Report to the Board of Visitors on Saturday, June 4th.

The following abstract relates to those portions of the report in which our readers will be most interested :—

As it has appeared desirable to publish places of fundamental stars more frequently, a catalogue of those for the five years 1887-91, reduced to the epoch 1890, has been prepared, and this will be made available for use in the *Nautical Almanac* for 1896, now in progress.

The part of the report relating to the *solar* department states that in the year ending 1892, May 10th, photographs of the sun were taken on 219 days. The solar activity has increased in a remarkable manner during the past year. Whilst there were 175 days without spots in 1890, there were only 21 such days in 1891, and since 1891, March 28th, the sun has not been free from spots on a single day on which it has been observed, the group of 1892, February 5th-18th, being the largest ever photographed at Greenwich; it appeared first on 1891, November 15th, and persisted till 1892, March 17th. A very large magnetic disturbance occurred on 1892, February 13th-14th, when the large sun-spot was on the central meridian, and others on March 6th, 11th, 12th, associated with its presence.

Magnetic Observations.—For the magnetic elements, the following are the principal results for 1891 :—

Mean declination (approximate)		17° 23′ West.
Mean horizontal force	3·9587	(in British units).
	1·8253	(in Metric units).
Mean dip	67° 19′ 49″	(by 9-inch needles).
	67° 21′ 0″	(by 6-inch needles).
	67° 23′ 22″	(by 3-inch needles).

In the year 1891 there were five days of great magnetic disturbance, but there were also about twenty other days of less disturbance.

Meteorological Observations.—All the meteorological instruments are in good order, and observations have been carried on with accustomed regularity. The mean temperature of 1891 was 48°·4, being 1°·1 below the average of the preceding fifty years. The highest air-temperature in the shade was 85°·1, on July 17th, and the lowest 12°·0, on January 10th. The mean monthly temperature in 1891 was below the average in all months excepting June, September, October, and December. The greatest pressure of the air was 31·5 lbs. on the square foot on November 11th. The number of hours of bright sunshine was

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1,222, about 66 hours below the average of the last 14 years. The rainfall was 25·0 ins., half-an-inch above the average. The mean daily motion of the air was 278 miles, being 4 below the average of the preceding twenty-four years.

Chronometers.—As regards chronometers and deck-watches, the average daily number rated was 248; the total received 765. For the annual trial 51 chronometers were sent in, of which 22 have been purchased for the Navy. For the deck-watch trial 72 were entered, of which 65 have been purchased for the Navy, 22 being classed as A and 43 as B.

Longitude.—Arrangements are being made for determination of longitudes Montreal-Canso-Waterville-Greenwich, and the first stage of the operations was completed on May 23rd. Time determinations were made in all on fourteen nights at Greenwich, twelve at Waterville, and about the same number at Canso and Montreal. The time of transmission along the cable Waterville-Canso was about a quarter of a second.

CORRESPONDENCE.

THE COMBUSTION OF COAL CARGOES.

To the Editor of the "Nautical Magazine."

SIR,—I have read the article on the inquiry into the loss of the ship *Carr Rock* in your April number with great interest, as I have several others from time to time, dealing with spontaneous combustion, and wish to suggest that in many cases the cause of combustion is not due to an accumulation of gas, but to the friction of one piece of coal with another, and that the stowage of coal cargoes ought to be considered.

I have noticed that in most cases of the burning of coal-laden ships, that fire has been discovered during or after a spell of boisterous weather, and generally in the vicinity of Cape Horn, or other equally stormy region. There is a certain amount of *life* in a coal-cargo, and a vessel labouring in a seaway will give the whole a corresponding motion. The corner of one piece of coal constantly grating on the flat surface of another, with the weight of a large portion of the cargo holding it in position, is liable to produce a spark at any time, which, falling on the fine gratings previously rubbed off, and immediately underneath, would produce combustion; for this fine dust will ignite like gunpowder.

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I draw my above conclusions from the following example:—Several years ago I was on board of a large iron ship, carrying a cargo of coal from Cardiff to San Francisco, and during the breaking out at the latter port a portion was arrived at on the 'tween-deck, between the fore and main hatches and about four feet from the ship's side, consisting of very large pieces, two of which, with the small coal lying on the deck between, had been burning, and had evidently taken fire in the way I have explained. Luckily, it had burned out soon after ignition, leaving the corner of one piece and the centre of the flat surface of the piece it had been in contact with, cindered to the depth of about three inches, with a circle of ashes and small cinders beneath, of about eighteen inches in diameter, which had burned through and charred the deck to the same extent. I may mention, that this being close to the ship's side, and amongst large coal, was certainly and constantly open to ventilation,

I have also noticed on several occasions elongated charred spots on the cargo stringers of coal-carrying vessels, evidently caused by friction, also elongated chafes on the otherwise smooth surface of pieces of coal, caused by a vibrating contact with others, but which had not taken fire.

Now, I would suggest a remedy for this, by relieving the pressure of one portion of the cargo upon another, by stowing in separate compartments after the rules of grain carriage in bulk, which method I am confident would greatly insure safety in coal carrying at sea. We seldom hear of combustion in steamships' coal bunkers, because the coal is here stowed in compartments, and has not the play that a whole cargo has, nor in small vessels, for the same reason.

Trusting you will consider my views worthy of publicity,

I am, Sir, yours truly,

WALTER NAYLOR, Master Mariner.

MASTERS' AND MATES' EXAMINATIONS.

To the Editor of the "Nautical Magazine."

SIR,—In the *Nautical Magazine* for April, 1891, is a letter on the growing importance of raising the status of the Mercantile Marine, by Clements R. Markham, a respected name. I would like to ask if it is the ship managers who desire this, or the better educated men in the Mercantile Marine. The former desire cheap men, who, it seems, are not

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inferior to the highly educated men in navigating their vessels and keeping them clear of rocks.

> "Honour and shame from no condition rise;
> Act well your part, there all the honour lies."

The whole question is one of supply and demand. At present the supply greatly exceeds the demand, and the only remedy for this is to raise the standard of the examinations for each grade—second mate, mate, and master. In this matter we do not expect the aid of the ship manager.

All the talk of a marine college, and Lord Brassey and Messrs. Devitt & Moore, will end in talk, and the unfortunate parents of those lads who are paying so much a year for being allowed to send their boys to sea, are buying experience.

In raising the standard of the examinations, the first thing to do is to insist that a man shall be able to spell correctly, speak and write fairly grammatically, and shall have served his proper time as second mate and mate in those grades.

To understand the use of our mother tongue is not quite so easy as we imagine, as the noble lord showed when he was speaking to the electors of the place he hoped to be member for: "Will you vote for the abolition of the Decalogue?" asked an elector. "What does he mean?" said the noble lord to the friend at his side. "He means," said his friend, "will you vote for the abolition of flogging in the army?" Which of course my lord promised to do, describing it as a brutal thing, &c.

To raise the status of the Mercantile Marine, we want men of general education, from good homes, as well as technical education.

I am, Sir, yours truly,

PALINURUS.

At Sea, May 3rd, 1892.

SAND DREDGER.

To the Editor of the "Nautical Magazine."

SIR,—The Mersey Docks and Harbour Board must be far behind the times if they think the new sand dredger of naval type, which they have ordered at Barrow, is a new invention. To my knowledge such dredgers have been at work for the last 25 years, at the new harbour of Ymuiden and also of Ostend; the latter place they deepened from 6 ft. to 22 ft. low water springs. It is a French invention, and the

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amount of work that is done by them is simply marvellous. I have had a great deal to do with them, so can write from experience.

I remain, truly yours,

Sunderland, June 12th, 1892. NEMO.

SHIPS' LIGHTS.

To the Editor of the "Nautical Magazine."

SIR,—In your last issue there appeared some remarks relative to ships' lights, showing diagrams of *courses steered*, indicated within three points.

Another very complete method to this end, and, worthy of *practical consideration*, obtains in the suggestion of Sir Digby Murray, Bart., of the Board of Trade.

Sir Digby recommends a bright light to be carried forward on steam-vessels in addition to the mast-head light, so placed as to be visible from right ahead to three points on either bow. Its distinctive feature as a *danger signal* would be that *it*, with the mast-head light, must be visible to the observer *long* before the coloured lights are sighted. Its advantage in this respect is obvious, by giving *timely* warning if there is any risk of collision.

The "giving-way" vessel requires such information as these afford, *conveyed from the distance*, that she may *reliably act* on their appearance.

In view of several dangerous positions confined to *vessels crossing* where *risk* is imminent, helm signals are "prime factors" in averting collision, and *no better* method appears than lights screened to warn vessels out of the danger arc; the alteration in a *vessel's course* would have the effect of causing *her* danger signal to appear, or disappear, as the case required.

The mast-head light, screened to cover *six points* from right ahead on either bow, obviously would radiate *then* over the principal "arc" of danger. The accompanying *diagram* will show lights set to disappear as the *course* is altered.

B, steering N.N.E., sights the danger signal, and consequently the mast-head light of A 1 bearing E.N.E., or 4 points on the starboard-bow, both lights in range. A 1 is steering W.S.W. The danger signal of B is not visible to A 1, consequently B is crossing ahead. A 1 checks her speed.

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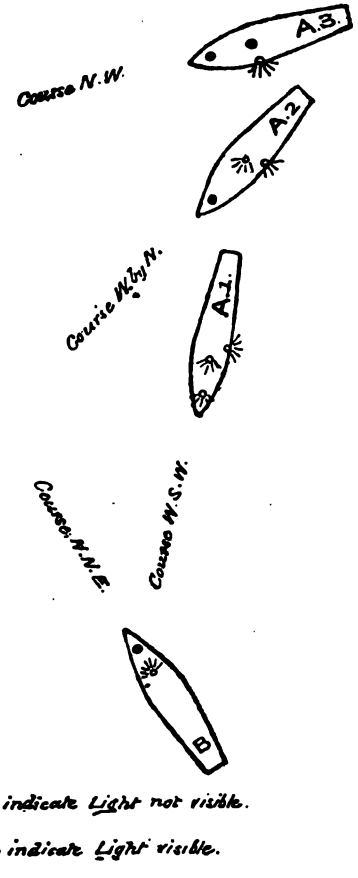
B sights the mast-head light of A 2, bearing E.N.E. A 2 is steering W. by N. B uses port-helm, showing his danger signal to A 2 from *right* to *left* (from *left* to *right* would be starboarding). A 2 cannot *starboard* without showing her *danger signal.*

In case *B* sights a red light to starboard 4 points, B ports his helm, A 3 having shut out her danger signal and *mast-head light.*



Sailing-vessels' coloured lights, *red* or *green*, range over an "arc" of ten compass points. These vessels lie within about six points of the wind.

It is possible to place lights on sailing-vessels that will show to the observer a double light: red to port and green to starboard, to appear from right ahead to six points on the bow,

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leaving the single *red* and *green* to show *two points forward and two abaft the beam.*

The International Maritime Conference were alive to the fact that *some* further indication of a *vessel's course* is necessary in submitting for consideration Article 2 E., "Regulations for preventing collisions at sea." That light might be readily converted into something more effective as suggested by Sir Digby Murray.

I am, Sir, your very obedient servant,

NAVIGATOR.

BOOKS RECEIVED.

Yacht Register for 1892. Published by Lloyd's Register of British and Foreign Shipping, 2, White Lion Court, Cornhill, London. 1892.

THE annual issue of this volume is now a matter of course, and is eagerly looked for by all interested in yachting affairs. The Register contains in addition to the names, class and other useful information relating to yachts classed by the Society, the names, dimensions, &c., of all yachts, the particulars of which are known; also a list of the various yacht clubs, with illustrations of their respective flags and the racing flags of yachts; the signal letters assigned to all yachts; a list of yachts arranged according to tonnage; an alphabetical list of yacht owners as well as builders and designers. The book is handsomely bound and excellently printed.

Annual Report of the Supervising Surgeon-General of the Marine Hospital Service of the United States. Washington: Government Printing Office. 1891.

A VALUABLE publication showing much useful public work accomplished and much individual suffering lessened. In this country we rely on private charity to carry out that which in the United States is effected by the State. There are nineteen marine hospitals, in which 15,349 patients were treated in the year reported on, while 37,643 were attended to at the dispensaries. The staff consists of the supervising surgeon-general, 15 surgeons, 20 passed assistant surgeons, 18 assistant

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surgeons, and 79 acting assistant surgeons. The services of this medical corps are mainly devoted to sick seamen at the various ports where hospitals are established. We think our Board of Trade might, with advantage, inquire into the working of the system and learn how their public usefulness might be extended by their initiating a service in this country analogous to that of the Marine Hospital Service of the United States.

Smithsonian Institution. Report to July, 1890. Washington: Government Printing Office. 1891.

THIS volume contains a general report of the operations of the Board of Regents in carrying out the business of the Institution and in developing the United States National Museum. It also gives, in a general appendix, a number of most interesting papers on scientific and other subjects.

OFFICIAL RETURN OF BRITISH WRECKS IN MAY, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of May, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	51	 11,226	 149
Steam	9	 5,121	..... 214*
Total	60	 16,347	 363

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports received in May relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—GEORGE J. SWANSTON, Assistant-Secretary, Marine Department, Board of Trade, 2nd June, 1892.

* Lost in the s.s. *Deccan*, of Bombay.

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THE ROYAL NAVAL RESERVE.

THE GAZETTES.

Admiralty, May 12th.

Sub-Lieutenant E. R. Robinson to be Lieutenant (to date May 11th, 1892).

Whitehall, May 20th.

THE Queen has been pleased to direct Letters Patent to be passed under the Great Seal of the United Kingdom of Great Britain and Ireland constituting and appointing the Right Honourable George Francis Hamilton (commonly called Lord George Francis Hamilton); Admiral Sir Anthony Hiley Hoskins, K.C.B.; Vice-Admiral Sir Frederick William Richards, K.C.B.; Rear-Admiral John Arbuthnot Fisher, C.B.; Rear-Admiral Frederick George Denham Bedford, C.B.; and Ellis Ashmead-Bartlett, Esq., to be Her Majesty's Commissioners for executing the office of Lord High Admiral of the said United Kingdom of Great Britain and Ireland, and the Dominions, Islands, and Territories thereunto belonging.

Admiralty, May 28th.

Sub-Lieutenant S. de B. Lockyer to be Lieutenant (to date May 27th, 1892).

Admiralty, June 13th.

Sub-Lieutenant J. Vigers to be Lieutenant (to date June 8th, 1892).

APPOINTMENTS.

Lieutenant: G. A. F. Hervey to *Howe* (to date July 8th).

SUB-LIEUTENANT W. J. FRASER was presented by the First Lord of the Admiralty at the Levée held by the Duke of Connaught at St. James's Palace on the 13th ult.

CHIEF-ENGINEER G. W. MANUEL, R.N.R., is sitting on a Committee at the Admiralty on Machinery and Boilers.

AT the anniversary festival of the Merchant Seamen's Orphan Asylum, held at the Cannon Street Hotel last month, we observed a good muster of Naval Reserve officers, including Captains Halpin, Richards, White, Andrews, Tomlin, Angove, and McKirdy. It was hoped that Prince George of Wales would have occupied the chair, but the late unhappy event in

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the Royal Family prevented this hope being realised. His place was taken by Admiral of the Fleet, Sir Edmund Commerell, G.C.B., V.C., who said that he had attended with special and peculiar pleasure, because he considered that in the present state of the Navy they would have to call upon the officers, seamen, and firemen of the Merchant Service to assist them in times of war, and therefore as a naval officer who had reached the top of the tree, he certainly felt that he was in his proper place in advocating the claims of the representatives of those who had died at sea and had lost their lives in the service of their country. England's greatness had been made in the past by her commerce and by her Mercantile Marine. He believed that in case of war we should have to supplement the Naval Service largely, not only from the Naval Reserve, but also by as many officers and men as could be obtained from the Mercantile Marine. At the conclusion of the dinner, the Secretary (Mr. F. W. Rawlinson) announced subscriptions amounting to £1,605 19s. 6d.

By the way, Captain Halpin, of *Great Eastern* fame, intends contesting Wicklow, in the Liberal Unionist interest, at the General Election. He made a good fight at the last election, and nearly succeeded, and we heartily wish that his efforts may now be crowned with success. This journal is strictly non-political, but we want the Reserve properly represented in the House of Commons, and every Reserve officer we are sure will join with us in wishing Captain Halpin success, for he undoubtedly would be the right man in the right place.

Volunteers are much exercised at present about the new decoration about to be bestowed upon them for long service. Mr. Stanhope has announced that it is not to be an orthodox medal, but it is generally believed that it will take the form of a miniature of the Queen in silver, on a blue ribbon with two bars. The officers of the militia are beginning to murmur at the prospect of being left out in the cold in this respect, with the result, no doubt, that it will be extended to them also; in which event care must be taken that the Reserve to the Royal Navy is not passed over.

The annual boat race of the cadet ships took place this year on the Thames, the *Conway* being represented by Commander

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MacIvor, R.N.R., Sir J. Poole, Captain Watt, and Captain Miller, R.N. The race was pluckily rowed from start to finish, although a foul unfortunately occurred; but the *Worcesters* succeeded in drawing ahead, and won by three boats' lengths. It is noteworthy that this boat race is attracting increased attention yearly, and bids fair in time to become one of the fashionable functions of the season.

A PROPOSAL of a rather revolutionary character is that of Fleet-Engineer Quick, R.N. He advocates the establishment of a combatant corps of Royal Naval Engineers, the title to include artificers, mechanics, and stokers, as well as officers. With these he would supersede the Royal Marines, relegating this smart corps to shore batteries and harbour defence ships, for the defence of ports and coaling stations. He argues that marines cannot be taught to be skilful mechanics, but on the other hand, mechanics can be taught to do marines' work on board ship, and he points out that it is impossible to over-estimate the importance of the speedy repair of the machinery of ships-of-war after an action, for the gain of only a few hours in effecting repairs after a battle may decide most important naval operations following upon either a slight or severe engagement. There is much to be said for and against the proposal, and we should like to see the question well threshed out at the Royal United Service Institution.

NEITHER the editor of the *Army and Navy Gazette, &c.*, nor any of the half-pay hacks who contribute the Naval notes to that "Journal of the Reserve and Auxiliary Forces," appear to have received cards for the Naval Reserve dinner recently held in London—at least we must come to that conclusion judging from the tone of the following report of that function furnished by our contemporary:—

"Some of the officers of the Royal Naval Reserve dined together on Thursday last, under the presidency of Lord Brassey. The toast of the Navy was responded to by Mr. Cawley, Lieutenant R.N.R., and that of the Army by Major-General Blake. The Volunteers do not appear to have been toasted, possibly because the subject has distasteful associations.

[To our contemporary, yes, but not to the Reserve.]

Mr. Crutchley, Lieutenant R.N.R., in responding to the toast of the evening, "Our Noble Selves," laid great stress upon the desire of the corps that it should be understood its members served for honour and glory only. "Dollars," said the speaker, "we do not want, but we are

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grievously distressed because we have to take rank after the Indian Marine." A great deal more was said about the long series of slights which had been offered to the corps, and altogether an impression is left, after reading the various speeches, that a more badly used body of men it would be difficult to come across in a day's sail. Not a word, however, do we find about a desire to make themselves a useful and valuable Reserve; so long as they are able to masquerade as the real thing, most of those present, if the speakers fairly represented their views, are quite content. Those Reserve men who are learning their business afloat should repudiate these amateurs, who pretend to represent them at home, or at least get them to alter the tone of their public utterances."

We reproduce this bit of service scurrility merely as another specimen of the pitiable ignorance and the uncalled for spleen displayed by this particular service paper whenever it has occasion to refer to the Royal Naval Reserve or its officers.

THE annual excursion of the seamen of the Naval Reserve at Liverpool, and their wives and families, took place on the 17th ult., when a party of about 500 crossed the river and proceeded to Eccleston Ferry, Chester, where a most enjoyable day was spent, dancing on the green and other amusements, including an extensive programme of athletic sports, excellent music being furnished by the band of the *Indefatigable*, under Mr. Smith.

As usual Lieut. Macnab had charge of the whole undertaking, and was assisted by Commanders Charles and Henry MacIver and J. Simpson; Lieuts. H. Dawson, J. Vigars; Sub-Lieuts. Blower, G. Stewart, Isaac R. Jones, W. Halsall, and Midshipman J. W. Williams. The guests included Commander G. H. Rainier, H.M.S. *Eagle*, and Mrs. Rainier, Captain Sankey, R.A., and Mrs. Sankey, Captain and Mrs. Bremner, of the *Indefatigable* training-ship; Messrs. J. L. Walker, of Chester; and J. H. Light, of the *Conway*.

A strong committee of R.N.R. seamen, aided by the petty officers of the *Eagle*, under the command of Mr. D. Grounds, Chief Instructor, assisted materially in carrying out the day's arrangements.

During the course of the day a most interesting event took place, when Lieut. Macnab, in the name of the Liverpool officers R.N.R., presented to Mrs. Rainier a very handsome solid silver tea service and a gold sovereign purse (by Messrs. Elkington). In making the presentation Lieut. Macnab said:—

"Mrs. Rainier, there are periods in our chequered lives

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when the restraints of custom, manners, and regulations may be relaxed to allow us the supreme happiness of expressing publicly, and without wounding the susceptibilities of others, our sense of high esteem for our fellows, and I am happy to say that I now find myself at one of those periods.

"During the three years that your husband has held command of the *Eagle* he has endeared himself to all with whom he has come in contact by his unvarying courtesy and kind thoughtfulness. Our happiness here to-day is seriously marred by the remembrance of the fact, which we all deplore, that at the end of this month he will have to retire from command of the *Eagle*. I am expressing the feelings of every officer in the Reserve who has met Captain Rainier, when I say that we deeply regret his severance from us, that we heartily acknowledge his many good actions on behalf of ourselves and the men, and the personal interest he has ever taken in our welfare.

"We may be told that Captain Rainier has only done his duty, but there are different ways of doing that duty, and without detracting from the good qualities of his predecessors, I may state our universal conviction that he has discharged the functions of commander of the *Eagle* in a manner which gave a satisfaction never before achieved in that ship, or we believe any other drill-ship in the United Kingdom. (Cheers.)

"Our attention has also long been directed, Mrs. Rainier, to the deep interest you have ever manifested in the well-being of the officers and men of the Reserve, and of the permanent crew of the ship, and that in all the good deeds of your husband towards us he has had your kindly sympathies and valuable aid. In the name, then, of the Liverpool and District R.N. Reserve officers, I have now to ask your acceptance of this tea service and sovereign purse, as a slight token of their respect and esteem, coupled with the wish that you and Captain Rainier may long be spared to each other, and hoping that whenever you have occasion to use any of the articles you may remember the many well wishers you left behind on the banks of the Mersey." (Loud applause.)

Commander C. MacIver said that the words used by his friend Lieut. Macnab went as far as possible in expressing the esteem for Captain and Mrs. Rainier of the Reserve, and of the general public in Liverpool, who had the pleasure of their acquaintance.

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Commanders H. MacIver and J. Simpson spoke in similar terms.

Lieut. H. Dawson, on behalf of the officers on the active list, bore testimony to the high standard of efficiency maintained in the training on board the *Eagle* during Captain Rainier's term, and the great progress the Reserve had made in Liverpool in that time, also thoroughly echoing the sentiments of the first speaker regarding the feelings of the officers.

Captain Rainier, who, on rising, received a perfect ovation, returned thanks on behalf of his wife, and in words full of emotion, traced the local progress of the Reserve during his period of office. The gallant captain, who was visibly affected, dwelt on the pride he felt in the force, and his regrets at severing his connection with it. He pointed to the splendid body of men, nearly 300 strong, who were there that day, and referred to the highly satisfactory reports he had had from the various admirals and captains in the fleet as to the ability and usefulness of the many Reserve officers who had served afloat in H.M. ships. The Admiralty had a splendid force in the Reserve, and he had no doubt knew it and desired it extended. He was pleased to see these encouragements given to the men and their families at Liverpool, where their friends, the shipowners, were always ready to lend a helping hand, and where such officers as the Commanders MacIver and the indefatigable Captain Macnab were untiring in their exertions for the welfare of both officers and men, and he trusted that other ports would follow the example. (Prolonged cheers.)

SERVICE CORRESPONDENCE.

ETTERS TO THE EDITOR.

[*The Editor desires it to be distinctly understood that he does not hold himself responsible for the opinions expressed by correspondents.*]

COLOURS FOR THE R.N.R.

SIR,—I should be obliged if you could enlighten me upon the following point. Are there any colours that can be worn by officers of the Royal Naval Reserve? Militia regiments wear the same colours as the regiment to which they are attached.

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If we have not got colours, then I think we ought to have a distinct ribbon for the R.N.R. I am, &c.,

London, June 4th, 1892. A. J. B.

[There are no distinctive colours for the R.N.R., but our correspondent's suggestion is an admirable one, which we trust will be taken up at once and satisfactorily settled. At the same time a motto and device might be adopted. We are constantly receiving letters from correspondents, headed with all sorts of mottoes and devices; some good and some—well, otherwise. We cordially invite suggestions on the above proposals.—ED. *N.M.*]

THE R.N.R. AND THE INDIAN MARINE.

SIR,—Whatever your correspondent "Ichabod," in your current month's issue, may be in practice, he certainly professes in theory, at least, to be anything but a believer in the philosophy of Helvetius. That self-interest in one or other of its many Protean forms is the mainspring of every human action is an axiom that "Ichabod" has naught but depreciation for, is clear from his conclusion that the "undesirable class of men" of the Royal Naval Reserve are those "who make use of the Reserve to forward their personal interests," and, inversely, but not so clearly, that the "most desirable members" are those who are likely, except a certain event be brought to pass, to sever "their connection with it."

Does "Ichabod" really believe that if the Admiralty remain obdurate in the matter of the Royal Indian Marine precedency question the "most desirable members" of the R.N.R. will resign their commissions *en masse?* Such an unhappy *dénoument* may or may not become an accomplished fact, and it is not wise to prophesy except one knows; but it may not be altogether out of place to point out to him that a proper spirit of submission to the inevitable is not by a long way incompatible with the noblest feelings human nature is cognisant of, although vanquished in a bravely conducted and bravely fought out forlorn hope. And it is quite a question whether those "most desirable" officers will indeed prove themselves to be so, by permitting their enthusiasm and zeal to cool so readily and so completely as to renounce the elevating work they have before them, because they have not been quite able to obtain all they want, all they most assuredly deserve, and all they have even a positive right to possess.

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As to "Ichabod's" "undesirable" ones, a practical and impartial sociologist could have nothing but the greatest possible hope and faith in them. In a distinctly utilitarian age it can be no slur for any man or any portion of a body of men, such as the Royal Naval Reserve, to be accused of making use of any particular organisation to forward his or their own personal interests; and it would be interesting to learn how your correspondent would explain that a Royal Naval Reserve officer, as such, could possibly forward his own personal interests without, at the same time, advancing the interests of the Royal Naval Reserve as a whole.

I am, &c.,

London, 8th June, 1892. JUSTE MILIEU.

THE R.N.R. AND INDIAN MARINE.

SIR,—I fear that it will be a venture barren in result for the officers of the Royal Naval Reserve to further attempt to dissuade the Admiralty from acting in a dishonourable manner towards them by ignoring the provisions of the Order in Council of March, 1864.

It must be admitted on all sides that they have formed a very dangerous precedent for all time, by being the first to break the contract, under the conditions of which every officer of the Reserve, who was such, prior to March 20th, 1891, was induced to become attached to that force. It is a lamentable state of affairs, when a body of men lose faith in the stability of another's word and bond; it is more than sufficient to engender and stimulate a feeling of distrust, even in our everyday business transactions; but infinitely more so is it when the head officials of Her Majesty's Royal Navy break faith with a class of men, who, of all others, it has been reckoned to be a national maritime advantage to act fairly to, and treat with conciliation.

I sincerely trust the preference and precedence given the newly-promoted force may tend to the strength of the Naval forces of the Empire; they are now evidently in "luck's way," and basking in the sunshine of someone's "good graces." How long it will last remains to be proved.

I do not envy the First Lord of the Admiralty the historical notoriety he has acquired by his action; the fact will be recorded that he and his Administration were the first to break the continuity of that direct right-hand support which the

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Mercantile Marine has afforded the Royal Navy since time out of mind by the interposition of a class of men who are only required to possess an elementary knowledge of seafaring life for the position to which they are assigned, in precedence to British seamen, who have more voluntarily given their services to the State than any other class of men, whether Volunteers or Regulars, calling Britain their home.

Yours, &c., TILBURY FORT.

THE NEW SOUTH WALES NAVAL BRIGADE.

SIR,—I notice in your March number of the current year, on page 266, you quote from an article by "S. V. Z.," on Australian Naval Defence, and you appear to assume that it refers to the whole of Australia, whereas it can only relate to the Colony of Victoria.

Perhaps I may be permitted to state that the Naval Brigade of New South Wales are all practical seamen; they number 328 all told, 50 being stationed at Newcastle. More than half are men-of-war's men who have taken their discharges from time to time and have settled down in the Colony, and it is worthy of mention that the Sydney portion form the crew of H.M. c.s. *Wolverene*, a corvette of 2,300 tons and 18 guns, without any outside assistance in the way of either seamen or stokers. At Easter the Brigade take the ship to sea for the annual training, which extends over some days, when sail drill, shot and shell practice, &c., and the routine of a man-of-war are strictly carried out; besides this, the vessel has a run on a Saturday in each month to keep their hands in.

The permanent staff of the *Wolverene* consists of only one engineer, a boatswain, four able-bodied seamen, and two stokers.

We are in hopes that ere long we shall have a more modern vessel handed over to us, one of the new Australian cruisers would be a great acquisition; and as two of these vessels are always laid up in Port Jackson, it is quite within the bounds of probability that our hopes may be some day realised.

By inserting the above in your valuable journal, you will oblige, Yours faithfully,

GEO. S. LINDEMAN,
Lieut. R.N. (Retired list), Commander Naval Brigade, N.S. Wales.

Sydney, 28th April, 1892.

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO JUNE 4TH.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Agamemnon ...	6	380	D.S. Bat.-ship, 1st cl.	Capt. C. Johnstone	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	... ...	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Aurora ...	12	467	... ...	Capt. A. D. Fanshawe ...	July 1, 1890, Devonport ...	Channel Squadron.
Australia ...	12	461	... ...	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Bellona ...	6	168	D.S. Cruiser, 3rd class	Comm. H. D. Barry	May 14, 1892, Devonport	Channel Squadron.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Camperdown ...	10	540	D.S. Bat.-ship, 1st cl.	Capt. F. Bridgeman-Simpson (V.-A. Sir M. Culme-Seymour.)	May 22, 1890, Portsmouth	Channel Squadron.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Cleopatra ...	14	280	... ...	Capt. W. M. Lang	Nov. 29, 1888, Devonport	Coast of America.
Collingwood ...	10	420	... ...	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	.. ... Malta ...	Mediterranean.
Curlew ...	4	97	D.S. Gun-ves., 1st cl.	Comm. H. D. Barry	June 22, 1886, Devonport	Channel Squadron.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Hecla	6	272	S. Torpedo depôt ship	Capt. J. Durnford	Re-c. Nov. 6,'88, Portsmouth	Mediterranean.
Howe	10	523	... ...	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5,'89, Hong Kong	China.
Mercury ...	13	280	... ...	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Narcissus ...	12	467	D.S. Bat.-ship, 1st cl.	Capt. J. H. Bainbridge ...	May 4, 1892, Devonport ...	Channel Squadron.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	...	D.S. Bat.-ship, 1st cl.	... ...	... ...	Portsmouth.
Sans Pareil ...	15	583	... ...	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	... ...	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Thunderer ...	4	401	D.S. Bat.-ship, 1st cl.	Capt. R. H. Hamond ...	April 11, 1891, Portsmouth	Mediterranean.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.
Victoria ...	15	587	D.S. Bat.-ship, 1st cl.	Capt. Hon. M. A. Bourke ... (V.-Ad. Sir Geo. Tryon.)	Re-c. April 29, 1890, Malta	Mediterranean.
Victory ...	26	...	... ...	Capt. H. C. Kane, C.B. ... (Admiral Rt. Hon. Earl Clanwilliam, K.C.B.)	Aug. 1, 1891, Portsmouth	Portsmouth.

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TIDE TABLES FOR JULY, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS.		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
F	1	6 31	6 53	11 12	11 40	8 11	8 37	7 6	7 31	9 56	10 17	3 43	4 4	11 9	11 30	3 35	3 58	4 24	4 46	9 34	9 55	3 37	4 1	0 32	1 3	8 25	8 48
S	2	7 17	7 40	—	0 8	9 4	9 32	7 58	8 26	10 41	11 6	4 24	4 45	11 53	—	4 23	4 50	5 9	5 33	10 17	10 42	4 27	4 54	1 35	2 8	9 12	9 38
S	3	8 5	8 30	0 3	1 4	10 1	10 30	8 55	9 24	11 33	—	5 8	5 32	0 18	0 45	5 19	5 49	5 58	6 25	11 10	11 40	5 21	5 48	2 39	3 7	10 7	10 38
M	4	9 0	9 31	1 31	1 58	10 59	11 29	9 54	10 23	0 3	0 35	6 58	6 26	1 14	1 45	6 21	6 54	6 54	7 24	—	0 10	6 16	6 44	3 35	4 2	11 11	11 43
T	5	10 2	10 35	2 25	2 52	11 58	—	10 51	11 18	1 9	1 42	6 56	7 26	2 16	2 47	7 25	7 54	7 55	8 25	0 41	1 12	7 12	7 40	4 26	4 49	—	0 14
W	6	11 6	11 36	3 19	3 46	0 25	0 51	11 44	—	2 14	2 44	7 56	8 25	3 19	3 52	8 22	8 49	8 54	9 23	1 43	2 13	8 8	8 35	5 11	5 33	0 43	1 10
Th	7	—	0 2	4 13	4 39	1 17	1 41	0 10	0 34	3 18	3 41	8 53	9 18	4 24	4 53	9 14	9 36	9 50	10 15	2 41	3 7	9 2	9 27	5 55	6 17	1 36	2 0
F	8	0 28	0 51	5 3	5 25	2 3	2 24	0 56	1 18	4 7	4 31	9 42	10 5	5 20	5 46	9 57	10 18	10 39	11 2	3 32	3 56	9 51	10 13	6 39	7 1	2 22	2 44
S	9	1 13	1 35	5 47	6 9	2 41	3 4	1 40	2 1	4 55	5 17	10 28	10 51	6 11	6 35	10 39	11 0	11 25	11 48	4 19	4 41	10 33	10 53	7 23	7 45	3 6	3 27
S	10	1 57	2 18	6 31	6 52	3 24	3 44	2 22	2 43	5 39	6 0	11 14	11 37	6 58	7 19	11 21	11 42	—	0 11	5 3	5 25	11 13	11 33	8 6	8 25	3 48	4 9
M	11	2 18	2 58	7 13	7 34	4 4	4 24	3 3	3 23	6 21	6 41	—	noon	7 39	7 59	—	0 3	0 33	0 54	5 46	6 7	11 53	—	8 49	9 2	4 29	4 49
T	12	3 18	3 39	7 54	8 14	4 45	5 6	3 43	4 3	7 0	7 19	0 22	0 44	8 19	8 39	0 24	0 45	1 15	1 36	6 38	6 49	0 14	0 35	9 21	9 40	5 9	5 30
W	13	4 0	4 22	8 34	8 55	5 28	5 50	4 21	4 45	7 39	8 0	1 7	1 30	8 59	9 19	1 6	1 27	1 56	2 17	7 10	7 31	0 57	1 19	10 0	10 21	5 51	6 12
Th	14	4 44	5 5	9 17	9 40	6 13	6 36	5 7	5 30	8 21	8 42	1 53	2 16	9 39	9 59	1 49	2 11	2 39	3 1	7 52	8 13	1 42	2 5	10 43	11 7	6 35	6 57
F	15	5 27	5 49	10 [illegible]	10 26	6 59	7 23	5 54	6 19	9 4	9 27	2 39	3 2	10 19	10 39	2 33	2 56	3 23	3 45	8 35	8 58	2 29	2 53	11 34	—	7 21	7 45
S	16	6 12	6 37	10 51	11 20	7 49	8 18	6 46	7 14	9 51	10 15	3 25	3 49	11 0	11 22	3 19	3 44	4 8	4 32	9 22	9 46	3 18	3 45	0 5	0 39	8 10	8 36
S	17	7 2	7 29	11 52	—	8 49	9 21	7 44	8 15	10 41	11 9	4 13	4 37	11 46	—	4 11	4 40	4 57	5 23	10 10	10 37	4 14	4 44	1 15	1 52	9 4	9 33
M	18	7 56	8 24	0 24	0 55	9 54	10 27	8 47	9 20	11 39	—	5 3	5 30	0 12	0 41	5 11	5 44	5 51	6 21	11 7	11 39	5 15	5 46	2 29	3 4	10 4	10 39
T	19	8 56	9 32	1 26	1 57	11 0	11 34	9 54	10 27	0 13	0 51	5 59	6 31	1 14	1 49	6 20	6 58	6 54	7 29	—	0 14	6 17	6 48	3 36	4 5	11 16	11 53
W	20	10 7	10 43	2 28	3 0	—	0 7	11 0	11 33	1 28	2 5	7 6	7 43	2 27	3 7	7 34	8 10	8 5	8 41	0 51	1 30	7 21	7 55	4 33	5 1	—	0 30
Th	21	11 21	11 59	3 34	4 9	0 40	1 12	—	0 6	2 41	3 17	8 22	8 56	3 48	4 28	8 44	9 16	9 19	9 54	2 9	2 47	8 31	9 7	5 29	5 57	1 6	1 40
F	22	—	0 32	4 42	5 12	1 43	2 12	0 37	1 7	3 53	4 25	9 28	9 59	5 6	5 40	9 45	10 13	10 26	10 56	3 20	3 50	9 39	10 8	6 25	6 53	2 10	2 38
S	23	1 0	1 28	5 40	6 7	2 39	3 4	1 35	2 0	4 53	5 18	10 27	10 54	6 10	6 38	10 39	11 4	11 24	11 51	4 18	4 44	10 32	10 55	7 21	7 47	3 4	3 28
S	24	1 55	2 20	6 38	6 57	3 27	3 49	2 24	2 47	5 42	6 6	11 20	11 44	7 2	7 25	11 28	11 50	—	0 16	5 8	5 31	11 17	11 39	8 10	8 31	3 52	4 15
M	25	2 48	3 4	7 19	7 40	4 11	4 32	3 3	3 28	6 28	6 48	—	0 7	7 46	8 5	—	0 11	0 39	1 1	5 53	6 13	—	noon	8 49	9 7	4 36	4 55
T	26	3 25	3 45	8 0	8 19	4 52	5 12	3 47	4 6	7 6	7 24	0 28	0 49	8 24	8 42	0 31	0 51	1 21	1 40	6 32	6 50	0 20	0 40	9 25	9 42	5 14	5 32
W	27	4 5	4 25	8 37	8 55	5 31	5 49	4 25	4 44	7 42	7 59	1 9	1 29	8 59	9 15	1 10	1 27	1 49	2 17	7 8	7 26	0 59	1 18	9 59	10 16	5 49	6 7
Th	28	4 43	5 0	9 13	9 31	6 7	6 26	5 2	5 21	8 16	8 32	1 48	2 7	9 31	9 47	1 44	2 1	2 34	2 51	7 44	8 1	1 37	1 56	10 34	10 53	6 25	6 43
F	29	5 17	5 34	9 49	10 7	6 45	7 4	5 40	6 0	8 47	9 2	2 26	2 44	10 2	10 16	2 18	2 35	3 8	3 25	8 18	8 34	2 15	2 34	11 13	11 34	7 1	7 19
S	30	5 51	6 9	10 25	10 45	7 23	43	6 20	6 40	9 16	9 32	3 1	3 18	10 30	10 45	2 53	3 11	3 42	4 0	8 51	9 8	2 52	3 11	11 58	—	7 38	7 57
S.	31	6 28	6 47	11 6	11 30	8 4	8 27	7 0	7 22	9 50	10 9	3 35	3 55	11 2	11 21	3 30	3 50	4 19	4 39	9 26	9 45	3 31	3 53	0 24	0 52	8 17	8 38

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−8 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 18	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 24	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbelltown	−0 28	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 28	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+ 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−8 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 8	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 59	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 18	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
276	England—Portland Harbour	New pier, lights, &c.
277	„ Spithead—Nab Rock	Buoy altered.
278	„ Thames Entrance	Buoyage altered.
279	„ River Humber—Paull Battery	*Occ.* electric light.
280	Scotland—Sound of Monarch—Causameal	Sunken rock.
281	„ „ Harris—Obb Pt.—Jane Twr.	Sunken rock.
282	North Sea—Netherlands—Ymuiden	Aut. whistle buoy withdrawn.
283	„ Elbe River—Neuwerk Is.	Temporary light.
284	Baltic—Gulf of Finland—Ärans Grund	New light in August.
285	„ Gulf of Bothnia—Gefle Bight	Lights altered.
286	„ „ Russia—Ulko-Nahkiainen Shl.	New light in August.
287	Spain—Cadiz Harbour	Position of buoys.
288	Mediterranean—Spain—Cartagena	Breakwater lights altered.
289	„ Ustica Is.—Gavazzi Pt.	Light altered.
290	„ Italy—Port Anzio	Lights on mole.
291	„ „ Leghorn—Squarci Baths	Light discontinued.
292	„ Candia (Crete)—Sitia Bay	New light.
293	Indian Ocean—Mauritius—Port Louis	Provisional light-vessel.
294	„ Seychelles Group	Non-existence of shoals.
295	Bay of Bengal—Burma—Oyster Is.	Light altered.
296	„ Chittagong—Kutabdia Is.	New light on January, 1893.
297	China—N.E. Cst.—Shantung	Light altered; fog-siren.
298	Yellow Sea—Korea—Chemulpho	Sunken rocks.
299	Japan—Inland Sea—Bingo Nada—Tomo	Reef.
300	„ Tokyo (Yedo)—Yokohama	Prohibited anchorage.
301	„ Yezo Str.—Kunashiri Is.—Kerami Saki	New light and fog-signal.
302	Australia—E. Cst.—Port Bowen	Now called Port Clinton.
303	„ „ Moreton Bay	Sunken rocks.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
304	AUSTRALIA—S. Cst.—Lady Bay—Warnambool	Light on breakwater.
305	TASMANIA—Macquarie Harb.	Leading lights.
306	NEW ZEALAND—N. Is.—Port Napier—Napier Bluff	Light on breakwater.
307	BRITISH COLUMBIA—Burrard Inlet—Parthia Shl.	Decreased depths.
308	„ Vancouver Is. — Barclay Sound—Castle Is.	Beacons uncertain.
309	NORTH AMERICA—W. Cst.—Mazatlan—Peresil Pt.	Shoal reported.
310	SOUTH AMERICA—E. Cst.—Magellan Str.—Cape Virgins	Reported dangers.
311	„ Rio de la Plata—Monte Video	Wrecks dangerous.
312	WEST INDIES—Martinique—Fort de France—Fort St. Louis	Light altered.
313	UNITED STATES—Florida Reefs—Key West	Buoyage altered.
314	„ Delaware—Delaware River	Various lights altered.
315	„ New York—Main Chan.—S.W. Spit	Light buoy.
316	„ „ Long Is. Sound—Sands Pt.	Light altered.
317	„ „ „ Oyster Bay and Execution Rocks	Lights altered.

NAUTICAL NOTICES.

All bearings Magnetic unless otherwise stated.

276.—ENGLAND. — *South Coast.* — *Portland Harbour.* — *New Pier, Lights, &c.*—A pier, 1,050 yards in length, has recently been constructed in Portland harbour, the outer end of which, in 22 ft. water, bears W. by N. ⅝ N. from the lighthouse on the extremity of Portland breakwater, and S. ¼ W. 1,360 yards from Sandsfoot castle. From this position the pier runs in a N.W. by W. ¾ W. direction to the shore. The outer extremity of this pier is temporarily marked at night by a *F. green* light. Also three targets have been moored in a N.N.E. ¼ E. direction from the extremity of this new pier, at distances of 400, 600, and 800 yards respectively, and these targets form an obstruction to vessels. They will, when practicable, each be marked at night with a *F. white* light. These targets are used for torpedo practice from the end of the aforesaid pier, and their vicinity should be avoided. Mariners are warned that when to the southward of Sandsfoot castle, they should not stand farther west than a line joining the outer end of the Nothe with the extremity of the new pier; at night the *green* light on the end of the pier should not be brought southward of a S.W. bearing. *Variation*, 18° *W.*

277.—ENGLAND.—*South Coast.*—*Spithead Approach.*—*Nab Rock Buoy.* —*Alteration in Character.*—With reference to Notice 230, p. 576, Nab rock buoy is now a black *conical* buoy, surmounted by a staff and two globes, with the words *Nab Rock* painted on it. Approx. position, lat. 50° 41′ 30″ N., long. 1° 2′ W.

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278.—ENGLAND.—*Thames Entrances.—Alterations in Buoyage, &c.*—The following buoyage changes have recently been made:—(1.) The *East Spile Buoy* has been moved 2¼ cables N. by E. ½ E. from its former position, and now lies in 30 ft. L.W. springs, with the following marks and bearings:—A conspicuous tree on the back high land, open to the westward of Leysdown church (St. Clement's), three times the length of the church, S.W. ¼ S. Sly.; Great Wakering church, in line with the N.W. mile beacon, N.W. ¾ N. Nly.; Cant buoy, W. by N. Nly., distant 2·4 miles; West Oaze buoy, N.W., distant 1·0 mile; Redsand buoy, E. Sly., distant 2·4 miles.

(2.) The *Columbine Buoy* has been moved S. ¼ W. 1½ cable from its former position, and now lies in 9 ft. L.W. springs, with the following marks and bearings:—The Parsonage house at Leysdown, midway between St. Clement's church and Leysdown coast-guard station, W. by N.; Shottenden mill, just opening east of the easternmost of two mills on the lowland, S.W. ¼ S. Sly.; a house at the inner end of Hampton pier, midway between Herne high mill and a house on the high land next east of it, S.E. ½ S.; Whitstable street buoy (new position), S. by E. ¼ E., distant ·4 mile; Columbine Spit buoy, W. ¼ S. Sly., distant ·9 mile; Middle Spaniard buoy, N. ¾ W., distant 2·4 miles.

(3). The *Whitstable Street Buoy* has been moved 2¼ cables E. ¾ N. Nly. from its former position, and now lies in 10 ft. L.W. springs, with the following marks and bearings:—The house eastward of Herne high mill just open east of a single house on the cliff to the westward of Hampton fishery pier, S.E. ¼ S. Sly.; Borstal mill twice its width the east side of the gap in a grove of trees on the back high land, S. by W. ¾ W. Wly.; Pollard Spit buoy, W. ¾ S. Sly., distant 2·2 miles; West Last buoy, E. ½ S. Sly., distant 5·4 miles; S.E. Middle buoy, N. by E ¼ E. Ely., distant 3·0 miles.

(4.) The *South Margate Buoy* has been moved 4 cables E. by S. ½ S. from its former position, and now lies in 20 ft. L.W. springs, with the following marks and bearings:—Monkton beacon, in line with the west side of the Western house at Cliff end, S.S.W. Wly.; Margate pier lighthouse, in line with the tower of St. Paul's church at Margate, S.E. by E. ¼ E. Ely.; South spit buoy, W. by N., distant 1·7 mile; North Margate beacon, N.E. ¼ N., distant 3·1 miles; Margate pier head, S.E. by E. ¾ E., distant 3·4 miles.

(5.) The *S.E. Margate Buoy* has been surmounted with a staff and globe, and moved 5 cables E. by S. ¾ S. from its former position; it now lies in 36 ft. L.W. springs, with the following marks and compass bearings:—The tower of the Congregational church at Margate, half its width open east of the tower of Trinity church, S.E. ¾ E.; Bishopston coast-guard station, half its width open south of Reculvers towers, W. ¼ N.; East Margate buoy, E. ¾ N., distant 4·4 miles; Margate pier head, S.E. by E. Ely., distant 1·8 mile; North Margate beacon, N. ¾ E. Ely., distant 2·9 miles.

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(6.) The *West Tongue Buoy* has been re-named *South Tongue*, and moved ¾ of a cable S. ¼ E. from its former position; it now lies in 38 ft. L.W. springs, with the following marks and bearings:—St. Peter's church tower, in line with the eastern end of the hotel Metropole at Margate, S.S.E. Ely.; Monkton beacon, a little east of the gap near the middle of Lower Hale grove, S. by W. ¼ W.; Pansand spit buoy, W. ¼ N., distant 3·0 miles; East Tongue buoy, east, distant 2 miles; North Margate beacon, S.E. ¼ S. Sly., distant 2·4 miles.

(7.) The *North Spit Buoy* has been moved 7 cables E. ¾ S. from its former position, and now lies in 43 ft. L.W. springs, with the following marks and bearings:—Monkton beacon, its width open west of two Malthouse cowls at Birchington, S.W. ¼ S. Sly.; St. Lawrence mill, midway between St. John's church, Margate, and the large house next west of it, S. ¼ W.; east Tongue buoy, N.N.W. ¼ W., distant 1·5 mile; N.E. Spit buoy, E. by S. ¼ S. Sly., distant 3·0 miles; north Margate beacon, W. by S. ¼ S. Sly., distant 1·2 mile.

(8.) The *S.E. Shingles Buoy* has been moved 3 cables W. by N. ¼ N. from its former position, and now lies in 33 ft. L.W. springs, with the following marks and bearings:—Girdler and South Shingles beacons in line, W. by N. ¼ N.; Minster mill, three times its height, open west of the Red tower and touching the east end of a wood, S. ¼ W.; East Shingles buoy, E. by N. ¼ N. Nly., distant 1·3 mile; East Tongue buoy, S.S.E. ¼ E. Ely., distant 1·5 mile; Princes channel light-vessel, W. Sly., distant 1·5 mile.

(9.) The *Gull Buoy* (in the Downs) has been moved 2 cables W.N.W. from its former position, and now lies in 31 ft. L.W. springs, with the following marks and bearings:—The Grand hotel, Broadstairs, midway between Broadstairs' mill and St. Peter's church, N.W. ¾ N.; the Obelisk at Ramsgate, in line with a tall chimney, and just open west of the waterworks reservoir, N.W. by W. ¾ W.; Goodwin Knoll buoy, S.E. ¼ E. Ely., distant 1·8 mile; Elbow buoy, N. by E. ¼ E., distant 2·5 miles; North Brake buoy, W. by N. Nly., distant 1·5 mile.

(10.) The *East Gilman* buoy has been re-named the *Gilman*.

279.—ENGLAND.—*East Coast.*—*River Humber.*—*Occasional Electric Light at Paull Battery.*—The War Department proposes to exhibit the *electric* search light at Paull battery (on the east shore of river Humber, and about 8 miles below Hull) between the undermentioned hours on the following nights in 1892:—June 29th, from 9 p.m. to midnight; July 19th, from 9 p.m. to midnight; July 20th, from 9 p.m. to midnight; July 21st, from 9 p.m. to midnight; August 24th, from 8 p.m. to 11 p.m.; September 28th, from 7 p.m. to 10 p.m.; October 26th, from 6 p.m. to 8 p.m.; November 30th, from 5 p.m. to 7 p.m.

Note.—The electric projector will be placed 45 ft. above H.W. on the parapet of Paull battery, and every precaution will be taken not to interfere with navigation.

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280.— SCOTLAND.— *West Coast.— Hebrides.— Sound of Monach.— Sunken Rock Westward of Causameal.*—A sunken rock, with probably less than 6 ft. water over it, and on which the sea breaks in heavy weather, lies with Causameal summit (25 ft.) bearing about E. ¼ S., distant 2¾ cables. Position, to be considered doubtful, lat. 57° 35′ 55″ N., long. 7° 36′ W.

281.—SCOTLAND.—*West Coast.—Hebrides.—Sound of Harris.—Obb Point Approach.—Sunken Rock N.W. of Jane Tower.*—A sunken rock, with probably less than 6 ft. water on it, lies near the fairway of approach to Obb point from the S.W., with the outer beacon on Obb point bearing N.E. ¼ N., and Jane tower S.E. ¼ E., distant three-quarters of a cable. Position, to be considered doubtful, lat. 57° 45′ 45″ N., long. 7° 2′ 15″ W. *Variation*, 28° *W.* The depths given are at L.W. springs.

282.—NORTH SEA.—*Netherlands.— Ymuiden Harbour Approach.— Withdrawal of Automatic Whistle Buoy.*—In the course of the summer of 1892, the automatic whistle buoy, in the approach to Ymuiden harbour, will be withdrawn. Approx. position, lat 52° 28½′ N., long. 4° 30′ E.

283.—NORTH SEA.—*German Coast.—Elbe River Entrance.—Temporary Alteration in Neuwerk Island Light.*—On account of the intended rebuilding of the lighthouse on Neuwerk island, the light would be replaced, on 16th May, 1892, by a light shown from the lower tower, and will be exhibited until further notice. The light shown from the lower tower on Neuwerk island is a *F. white* light, visible from the bearing of east, through south, to N.W. Elevated 59 ft. above H.W., and seen 10 miles. Approx. position, lat. 53° 55′ 15″ N., long. 8° 29′ 30″ E. *Variation*, 18° *W.*

284.—BALTIC.—*Gulf of Finland.—Intended Light-Vessel with Fog-Signal on Ärans Grund.*—In August, 1892, a light-vessel (named *Aerans grund*) will be placed on the southern or south-eastern side of Ärans (Ny) grund, north shore of the Gulf of Finland. It will show two *F. red* lights (one at each masthead) of 6th order. The light-vessel of iron, will have two masts, and carry a frame globe at each masthead. Approx. position, lat. 59° 59′ N., long. 24° 52¼′ E. Also, a steam fog-siren will be established on board the light-vessel.

285.—BALTIC.—*Gulf of Bothnia.—Swedish Coast.—Gefle Bight.— Discontinuance of Skutskär Harbour Light, and Intended Light near West Point of Maderö.*—After 31st May, 1892, Skutskär harbour light, in approximately lat. 60° 39¼′ N., long. 17° 24¾′ E., would be discontinued, and on 1st August, 1892, a light will be exhibited from a lighthouse erected near the west point of Maderö (Maderön), at the entrance to Skutskärs harbour. Maderö light will be a *Fl.* light, showing *red* from the bearing of S. 14° E. to S. 2° E., and *white* from S. 2° E., through south, to S. 67° W. Elevated 18 ft. above the sea, and visible; the white light about 6 miles, the red light 4 miles. Ill.

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app. dioptric of 6th order. Lighthouse, of iron, stands on a stone pier. Approx position, lat. 60° 39′ 20″ N., long. 17° 24′ 40″ E. *Variation*, 7° *W.* Exhibited annually from 1st April to 15th May, and from 1st August to 31st December.

286.—Baltic.—*Gulf of Bothnia.—Russian Coast.—Intended Light-Vessel with Fog-Signal near Ulko-Nahkiainen-Shoal.*—In the month of August, 1892, a light-vessel (named *Nahkiainen*) will be placed on the southern or south-western side of Ulko-Nahkiainen shoal, east shore of the Gulf of Bothnia. It will show two *F. white* lights (one at each masthead) of 6th order. The light-vessel, of iron, will have two masts, and carry a frame globe at each masthead. Approx. position, lat. 64° 35′ N., long. 23° 51′ E. Also, a steam fog-siren will be established on board the light-vessel. Further particulars will be given.

287.—Spain.—*South Coast.—Cadiz Harbour Entrance.—Positions of Certain Buoys.*—(1.) Los Cochinos shoal buoy lies with Las Puercas beacon bearing S. 58° E., distant 5¼ cables, and San Sebastian light-house S. 22° W. (2.) El Diamante shoal buoy lies with Sta. Catalina castle bearing N. 74° E., and Las Puercas beacon S. 25° W., distant 8 cables. (3.) El Fraile shoal buoy lies with Puntales castle bearing S. 5° E., and Las Puercas beacon N. 86° W., distant 1$\frac{1}{10}$th mile nearly. Recent soundings in the channel of the port show that some change has taken place; these soundings will shortly be published. *Variation*, 17° *W.*

288.—Mediterranean.—*Spain.—Cartagena Harbour.—Exhibition of Permanent Lights on Breakwaters, and Discontinuance of Podadera Point Light.*—On 1st July, 1892, the permanent lights will be exhibited from lighthouses erected on the outer extremes of Navidad and Curra breakwaters, Cartagena harbour; and Podadera point light will be discontinued. (1.) Navidad breakwater permanent light will be a *F. red* light of 6th order, elevated 48 ft. above the sea, and visible 8 miles. Lighthouse, 34 ft. high, of stone (light red in colour), and cylindrical in shape, situated about 26 yards within the circular head of the breakwater. Approx. position, lat. 37° 34′ 50″ N., long. 0° 58′ 50″ W. (2.) Curra breakwater permanent light will be a *F. green* light of 6th order, elevated 48 ft. above the sea, and visible 8 miles. Lighthouse, 34 ft. high, of stone (white in colour), and cylindrical in shape, situated on the circular head of the breakwater.

289.—Mediterranean.—*Ustica Island.—Gavazzi Point Light.—Alteration in Character.*—This will be a *F. and Fl. white* light as heretofore, but the flashes will be shown *every minute*, and the duration of the flash will be *four and a-half seconds*. Approx. position, lat. 38° 41′ 30″ N., long. 13° 9′ 5″ E.

290.—Mediterranean.—*Italy.—West Coast.—Port Anzio.—Harbour Lights on Mole.*—With reference to notice in 1891, on 1st July, 1892, the *F. red* light on the old Innocenziano mole head, port Anzio, will be discontinued; and the *F. green* light on the outer extremity of the

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extension of that mole will be altered to a *F. red* light, visible 2 miles. Approx. position, lat. 41° 26¼′ N., long. 12° 38′ E.

291.—MEDITERRANEAN.—*Italy.—West Coast.—Port of Leghorn.—Discontinuance of Squarci Baths Light.*—Discontinued since 1st June, 1892.

292.—MEDITERRANEAN.—*Candia or Crete.—North Coast.—Sitia Bay.—Light on Cape Sitia.*—The Ottoman Government has given notice, that on 25th June, 1892, a light will be exhibited on cape Sitia (Babakia), west side of Sitia bay. Cape Sitia light will be a *F. red* light, visible in clear weather from a distance of 6 miles. Approx. position on chart, No. 2536*b*, lat. 35° 14′ N., long. 26° 8′ E.

293.—INDIAN OCEAN.—*Mauritius.—Port Louis Entrance.—Provisional Light-vessel.*—A provisional light-vessel has been placed in the position of the permanent light-vessel at the entrance to port Louis; and from 10th May, 1892, until the *Fl. white* light can be replaced, three *F. white* lights, placed triangularly, and visible about 3 miles, will be exhibited from that vessel. Provisional light-vessel carries a black ball at the masthead as a day mark. Approx. position, lat. 20° 8′ S., long. 57° 29′ E.

294.—INDIAN OCEAN.—*Seychelles Group.*—(1.) *Non-Existence of Mellow Rock.*—The port officer, pilots, and fishermen, resident on the Seychelles, are unanimously of opinion that Mellow rock, charted as lying about 10 miles north-eastward of Praslin island, and described as drying at low water, does not exist. This rock, the original authority for which is unknown, has therefore been expunged from the Admiralty charts. Approx. position has heretofore given, lat. 4° 11¼′ S., long. 55° 51′ E.

(2.) *Non-Existence of Shoals N.E. and East of Chimney Rocks.*—The positions of the two shoals (marked D) charted as lying about 1½ mile N.E. and east of Chimney rocks respectively, were passed over by H.M. surveying vessel *Stork* on two occasions, but no indication of shoal water was seen; the pilot also stated that no shoals other than Chimney and Renommée rocks exist in the immediate neighbourhood. These shoals therefore have also been removed from the charts. Approx. position of Chimney rocks, lat. 4° 27¾′ S., long. 55° 52¼′ E.

295.—BAY OF BENGAL.—*Burma Coast.—Oyster Island Light.—Alteration in Sector of Red Light.*—With reference to previous notice on examination of Oyster reef, it has been found necessary to alter the sector of *red* light shown from Oyster island lighthouse, as follows:—Oyster island light is an *Occ.* light, eclipsed for a period of *two seconds every half minute*, and now shows *white* through an arc of 345°, or from the bearing of N. 89° W., through east, to N. 54° W., and *red* through the remaining portion of arc (15°) over Oyster reef. Elevated 130 ft. above the sea, and visible 17 miles. Approx. position, lat. 20° 12′ N., long. 92° 33′ E. *Variation* 8° *E.*

296.—BAY OF BENGAL.—*Chittagong Coast.—Kutabdia Island Light.—Further Delay in Alteration in Character.*—It was intended to make the following alteration in the character of Kutabdia island light; but from

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unexpected delays, the alteration is now postponed to 1st January, 1893:—Kutabdia island light will be a *Fl. white* light, with an eclipse of *one minute* between the flashes; elevated 121 ft. above H.W., and visible 17 miles. Until the exhibition of the permanent light, the existing light (*F. white*) will be shown from the lighthouse 30 ft. lower than formerly; and a *blue* light will be burnt *every quarter of an hour* between 7 p.m. and 5 a.m. On the exhibition of the new light, the *blue* light will be discontinued. Approx. position, lat. 21° 52½′ N., long. 91° 50′ E.

297. — China. — *N.E. Coast. — Shantung N.E. Promontory. — Intended Alteration in Character of Light, and Establishment of Fog-Siren.*—Intended to be an *Occ.* light. Approx. position, lat. 37° 24′ N., long. 122° 42′ E. Also, it is intended to establish a fog-siren at Shantung N.E. promontory, which will sound a *high* and *low* note.

298.—Yellow Sea.—*Korea.—West Coast.—Chemulpho Approach and Anchorage.—Sunken Rocks.*—Derived from a plan recently issued by the Japanese Government:—(1.) A rock, which dries 2 ft., lies in the approach to Chemulpho, with South Watcher bearing E. by N. ¾ N., distant $1\frac{1}{10}$ mile, and Yung Hung Do clump (500 feet) south. Approx. position, lat. 37° 18′ 20″ N., long. 126° 27′ 30″ E. (2.) A rock, with 2 fathoms water on it, lies in Chemulpho anchorage, with centre of So Wolmi (Observation island) bearing N.E. ¾ E., distant $2\frac{3}{10}$ miles. (3.) A rock, with 3½ fathoms water on it, lies in Chemulpho anchorage, with Muttchi islet summit bearing N. ¼ E., distant 6½ cables. (4.) A rock, with 1½ fathom water on it, lies in Chemulpho anchorage, with Muttchi islet summit bearing N.W. by W. ¾ W., distant 3 cables. The depths are at L.W. springs. *Variation*, 5° *W.*

299.—Japan.—*Seto Uchi or Inland Sea.—Bingo Nada.—Reef Eastward of Tomo Harbour.*—A reef, locally known as *Nadaishi*, lies about 3½ miles eastward of Tomo harbour, north shore of Bingo Nada. It extends within the 2-fathoms line about 33 yards in an east and west direction, with a breadth of 20 yards, and has a least depth of 2½ ft. on it at L.W. springs, and is steep to around, except on the north and south sides, where shoal water exists for some distance. It lies with centre of Hakama bearing S.S.E., distant 1¼ mile, and south extreme of Senswi Sima W. ¼ N. Approx. position, lat. 34° 22′ 45″ N., long. 133° 26′ 50″ E. *Variation*, 5° *W.*

300.—Japan.—*Gulf of Tokyo or Yedo.—Yokohama Harbour.—Prohibited Anchorage.*—Regulations for vessels entering or leaving the harbour of Yokohama, enclosed by the breakwaters in course of construction:—(1.) The space enclosed between two parallel lines half a mile long, measured west of the two temporary light-vessels, shall be preserved as a fairway, and vessels are prohibited from anchoring within it, or from swinging within it when at anchor. (2.) Dredging operations are in progress, and will be gradually extended over a large part of the anchorage; vessels should not approach, or anchor within, the areas

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occupied by the dredger. The limits of these areas, when necessary, will be marked by small red and white buoys.

301.—JAPAN.—*Yezo Strait.—Kunashiri Island.—Light and Fog-Signal on Keramoi Saki.*—Exhibited from a lighthouse erected on Keramoi Saki (Keramui Misaki), the south extreme of Kunashiri island. It is a *Fl. white* light of 5th order, showing a *flash every fifteen seconds*, and visible through an arc of 302°, or from the bearing of S. 6° E., through E. and N., to S. 52° W. Elevated 45 ft. above the sea, and seen 12 miles. Lighthouse, 40 ft. high, of wood, and octagonal, is painted black and white in horizontal bands. Approx. position, lat. 43° 40′ N., long. 145° 31′ E. *Variation*, 5° *W.* Also, a fog-bell at the lighthouse will be sounded *twelve times every minute.*

Note.—This light will not be exhibited, nor the bell sounded, during the months of January and February annually.

302.—AUSTRALIA.—*East Coast.—Port Bowen to be known in future as Port Clinton.*—In consequence of frequent confusion having arisen from the similarity of names between the township of Bowen (port Denison) and port Bowen—port Bowen will in future be known as port Clinton.

303.—AUSTRALIA.—*East Coast.—Sunken Rocks on West Shore of Moreton Bay.*—(1.) *Otter rock*, with 5 ft. water on it, lies with the Δ on Woody point bearing N.N.W. ¼ W., distant 8¼ cables. A *can* buoy, painted red and black, has been placed near the east edge of this rock. Approx. position, lat. 27° 16′ 30″ S., long. 153° 8′ 10″ E. (2.) *Garnet rock*, with 5 ft. water on it, lies with the S.E. extreme of Red cliff point bearing N.W., distant 5 cables. A *can* buoy, painted red and black, has been placed near the N.E. edge of this rock. Approx. position, lat. 27° 14′ 40″ S., long. 153° 8′ 35″ E. (3.) A rock with 3 ft. water on it, lies with North reef beacon bearing N. ¼ E., distant 7¾ cables. Approx. position, lat. 27° 12′ 10″ S., long. 153° 8′ 40″ E. *Variation*, 9° *E.* The depths given are at L.W. springs.

304. — AUSTRALIA. — *South Coast. — Lady Bay. — Warnambool. — Harbour Light on Breakwater.*—Exhibited from a post erected on the outer extreme of the breakwater at Warnambool. It is a *F. red* light, elevated about 30 ft. above H.W., and visible about 8 miles. Approx. position, lat. 38° 24′ 15″ S., long. 142° 28′ 50″ E.

305. — TASMANIA. — *West Coast.— Macquarie Harbour. — Leading Lights.*—Two leading lights are exhibited from lighthouses recently erected on Entrance and Bushy islets, Macquarie harbour entrance:—(1.) Entrance islet light is *F. white*, elevated 34 ft. above the sea, and visible, where not obscured by the land, 11 miles. Ill. app. dioptric of the 4th order. Approx. position, lat. 42° 11¾′ S., long. 145° 13½′ E. (2.) Bushy (Cap and Bonnet) islet light is *F. green*, elevated 45 ft. above the sea. Ill. app. dioptric of the 5th order. These lighthouses are situated on the sites previously occupied by the leading beacons.

306.—NEW ZEALAND.—*North Island.—East Coast.—Hawke Bay.—Port Napier.—Napier Bluff.—Light on Breakwater.*—A *F. red* light is

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exhibited on the outer end of the breakwater at Napier (Ahuriri) bluff, and will be shifted outward as the works are advanced. Mariners should give the breakwater works a good berth, as submerged portions extend some distance seaward. Approx. position, lat. 39° 28½′ S., long. 176° 57′ E.

Note.—As the position of this breakwater is uncertain, the light is not yet shown on the Admiralty charts.

307.—British Columbia.—*Burrard Inlet.*—*Decreased Depths on Parthia Shoal.*—A recent survey of Burrard inlet shows that *Parthia shoal*, lying N.W. of Brockton point, has depths of 3½ fathoms on it at L.W. springs (hard bottom), and that within the 5-fathoms line, it extends about 3½ cables in an east and west direction, with an average breadth of one cable. Its eastern edge lies with the east extreme of Brockton point bearing S.E. ¼ E., distant 2½ cables, and Moodyville saw mill N.E. by E. ⅝ E. *Variation*, 23° *E.*

Note.—Vessels of heavy draught should proceed with caution in this vicinity.

308.—British Columbia.—*Vancouver Island.*—*Barclay Sound.*—*Castle Islet Beacon Destroyed.*—The beacon on Castle islet, Western channel, Barclay sound, has been destroyed, and the remains of it are lying on the north side of the islet. Approx. position of site, lat. 48° 57½′ N., long. 125° 23′ W.

A note that "The beacons are not always to be relied on," has been placed on chart.

309.—North America.—*West Coast.*—*Mexico.*—*Mazatlan Harbour Approach.*—*Shoal Reported Westward of Peresil Point.*—Reported existence of a shoal, on which it is stated the sea breaks in moderate weather, with deeper water inshore of it, lying in the approach to Mazatlan harbour from the N.W., with Peresil point bearing east, distant half a mile. The existence of this shoal is to be considered doubtful. Approx. position, lat. 23° 12′ 15″ N., long. 106° 28′ 15″ W.

Note.—The buoy, charted as marking Blossom rock, at the entrance to Mazatlan harbour, does not exist. A fort, recently constructed on Pala point, west side of Mazatlan harbour, is situated about 200 yards S.S.E. ⅝ E. from the signal tower on the point, and is about 150 feet above the sea. *Variation*, 10° *E.*

310.—South America.—*Magellan Strait.*—*East Entrance.*—*Reported Dangers Eastward of Cape Virgins.*—Several reports have been made of late years of vessels striking outside the limits of charted danger eastward of cape Virgins. Careful examination of these reports shows that the estimated positions of these vessels vary considerably, and in no case is there any evidence to show where they really were. All the accidents occurred during the night, and while the absence of feature on the land makes it at all times extremely difficult to fix a position, the velocity and rapid changes in the tidal streams still further at times complicate navigation. Therefore, although it is evident that the absence of close

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soundings to seaward of cape Virgins makes it impossible to say positively that there is not a danger uncharted, it is not considered that there is sufficient evidence to justify the idea that there is one. The following note has been placed upon the Admiralty charts:—The entrance to Magellan strait should be approached with great care. The velocity of the tidal streams, the variability of their direction off cape Virgins, and the absence of good objects with which to fix the ship, make the determination of position, and the steering an intended course, very uncertain.

311.—South America.—*East Coast.—Rio de la Plata.—Monte Video Road.—Information Concerning Certain Sunken Wrecks.*—With reference to notice in 1892, the following further information concerning certain sunken wrecks lying in Monte Video road, has been received; 30th April, 1892:—(1.) The wrecks charted as lying respectively about 1 mile and 1¼ mile in a southerly direction from the Cathedral are no longer obstructions to navigation, and the buoys and light-vessel previously marking the southern wreck have been withdrawn. (2.) A dangerous sunken wreck, with mast just showing at half tide, lies 4 cables E. ¼ S. from Tagus rock, and is marked by two black *conical* buoys placed N.W. and S.E. of it, also by a hulk moored about 2 cables N.E. of it, from which is exhibited a *white* light above a faint *red* light. Approx. position, lat. 34° 55′ 20″ S., long. 56° 14′ 10″ W. (3.) The wreck of the German steam-vessel *Corrientes*, with mast showing at L.W., lies half a cable S.S.E. from Tagus rock, and is marked by a black *spherical* buoy attached to it. The pole buoy previously marking Tagus rock has been withdrawn. *Variation*, 7° *E.*

312.—West Indies.—*Martinique.—Fort de France Harbour.—Alterations in Fort St. Louis Light.*—This is now a *F. red* light, with two sectors of *F. white* light showing *red* through an arc of 180°, or between the bearings of N.W. by W. ¼ W. and S.E. by E. ¼ E.; and *white* on each side of the red light, through an arc of 45° inshore of those bearings. The light, shown from a white structure, is elevated 27 ft. above the sea, and visible 9 miles. Ill. app. dioptric. Approx. position, lat. 14° 36′ N., long. 61° 4¼′ W. *Variation*, 1° *W.*

313. — United States. — *Florida. — Florida Reefs. — Key West Harbour.—Alterations in Buoyage, &c.*—The following alterations have been made:—(1.) The 21-ft. shoal lying westward of fort Taylor has been marked by a red buoy, No. 8, moored in 21 ft. water, with Key West lighthouse bearing E. ⅛ N., and S.W. bastion of fort Taylor S.E. by E. ¼ E., distant 2¼ cables. (2.) Black buoy, No. 11, has been moved to the southward, and now lies in 21 ft. water, with Key West lighthouse bearing E. by N. ¼ N., and S.W. bastion of fort Taylor E. ¼ N., distant 4¼ cables. (3.) Black buoy, No. 17, lies about one cable S. by E. from its hitherto charted position, and from it, in the direction of Tift's observatory, a shoal, with 16 ft. water on it, extends nearly one-third the distance from the buoy to the wharf.

Note.—The pilots state that in the Triangles in Main Ship channel

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there are several 19-ft. patches lying in the fairway between West Triangle buoy, No. 3, and the black and red striped buoy. The depths given are at L.W. *Variation*, 3° *E.*

314.—UNITED STATES.—*Delaware.—Delaware River.*—(1.) *Brandywine Shoal Light.—Alteration in Character.*—Now an *Occ. white* light, visible *twenty-seven seconds*, and eclipsed *three seconds*. Approx. position, lat. 38° 59′ N., long. 75° 7′ W.

(2.) *Fourteen Feet Bank Light.—Alteration in Character.*—Now an *Occ. white* light, visible *fourteen seconds*, eclipsed *three seconds*, again visible *forty seconds*, and again eclipsed *three seconds*. Approx. position, lat. 39° 3′ N., long. 75° 11¼′ W.

(3.) *Cross Ledge Light.—Alteration in Character.*—Now an *Occ. white* light, visible *seventeen seconds* and eclipsed *three seconds*. Approx. position, lat. 39° 9¾′ N., long. 75° 14¼′ W.

(4.) *Ship John Shoal Light.—Alteration in Character.*—Now an *intermittent white* light, visible *fifty-seven seconds*, and eclipsed *three seconds*. Approx. position, lat. 39° 18¼′ N., long. 75° 23′ W.

Note.—In other respects, the above-mentioned lights will remain unaltered.

315.—UNITED STATES.—*New York.—New York Approach.—Main Channel.—Light Buoy near S.W. Spit.*—On or about 15th June, 1892, a red *spar* buoy, from which will be exhibited a *F. red* light, will be moored about 50 ft. N.N.E. of S.W. spit buoy (*conical* red with perch and ball, No. 12). Main channel, approach to New York from the southward. Elevated about 10 ft. above the sea, and seen about 2 miles. Approx. position, lat. 40° 28′ 50″ N., long. 74° 2′ 30″ W. *Variation*, 8° *W.*

Note.—The electric submarine cable supplying this buoy is laid in a S.E. by E. ½ E. direction from it to a cove near the N.W. end of Sandy Hook. Vessels should not anchor near this line. To be well clear of the cable, anchorage should be taken up southward of the direction indicated by Sandy Hook lighthouse and Sandy Hook west beacon in line.

316.—UNITED STATES.—*New York.—Long Island Sound.—Sands Point Light.—Alteration in Character.*—This light is now *F. white.* Approx. position, lat. 40° 52′ N., long. 73° 44′ W.

317.—UNITED STATES.—*New York.—Long Island Sound.*—(1.) *Oyster Bay.—Alteration in the Character of Cold Spring Harbour Light.*—Cold Spring harbour (Centre Hog island) light is *F. white*, showing a sector of *F. red* light from the bearing of S.E. ¾ E. (indicating Centre island reef or Middle ground buoy, black, No. 17), through east, to N.E. ¼ E. Approx. position, lat. 40° 54¾′ N., long. 73° 29½′ W.

(2.) *Execution Rocks Light.—Alteration in Character.*—It is now a *Fl. white* light *every thirty seconds*, showing a sector of *Fl. red* light through an arc of 37°, or from the bearing of N.E. ¼ N. to E. by N. (the present sector of *F. red* light). Approx. position, lat. 40° 52¼′ N., long. 73° 44′ W. *Variation*, 8° *W.*

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OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
3rd June, 1892.

THE following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

NOTE.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
2268	England, S.: Portland Harbour ..	Large corrections, and new compasses. May.
73	Spain, N.: Port Pasages	New Chart. May.
2074	Mediterranean: Cyprus	New Chart. May.
895	Indian Archipelago: Alas Strait ..	Corrections throughout, also to names. May.
722	Indian Ocean: Seychelles, Mahé Island, approaches to Port Victoria	New Chart. May.
2818	N. America, E: James River, Hampton Roads and Elizabeth River	New Chart. May.
323	West Indies: Ports and anchorages in the Bahamas	New Chart. May.
1127	River St. Lawrence: Montreal Harbour	Correction throughout. April.
2177	Arctic Sea: Baffin Bay, Sheet I.	Davis Strait. May.

Agent for the sale of Admiralty Charts, MR. J. D. POTTER, 31, *Poultry, London, E.C.*

(COPY.)

Her Majesty's Consulate General, Hamburg, 2nd June, 1892.

My Lord,—I have the honour to report to your Lordship that submarine mines practice will take place during the period from the 6th instant until the 31st August next, between Kratzsand and Spitzsand, eastward from the channel of the river Elbe, over an area extending from the flats to an imaginary line running along the buoys Nos. 11, 12, and 13.

The limits of this mine field will be marked by four flat-bottomed buoys with red flags, and within this area no vessel will be permitted to pass or to anchor.

Guard-boats will be stationed near the scene of operations, and will be distinguished by four small masts and one tall mast for signal purposes.

All vessels must pass to the westward of the field of operations, and any directions given by the officers in command of the guard-boats must

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be obeyed under a penalty of 60 marks fine, or imprisonment for a fortnight.

I have, &c.,

(Signed) CHAS. S. DUNDAS, Consul-General.

The Right Hon. Marquis of Salisbury, K.G.,
Her Majesty's Principal Secretary of State for Foreign Affairs,
Foreign Office, London.

THE Committee appointed in July, 1890, to consider the regulations for preventing collisions at sea, adopted at the Washington International Marine Conference, held a meeting at the Board of Trade, Sir Charles Hall, K.C.M.G., Q.C., M.P., being in the chair.

THE Board of Trade have awarded their silver medal for gallantry in saving life at sea to Mr. Paul Holland Millar, late fifth officer, and their bronze medal to James Orman, late quartermaster of the steamship *Moselle*, of London, in recognition of their gallant attempt to rescue the master of that vessel when she stranded off Point Toro, near Colon, on the 29th October last.

THE Board of Trade have received through the Foreign Office a binocular glass, which has been presented by the French Government to Mr. Stephen Evans, master of the schooner *Mostyn*, of Chester, in recognition of his kindness and humanity in rescuing the shipwrecked crew of the French steamer *Trignac*, near the Scilly Islands, on the 19th February last.

THE Board of Trade have awarded their silver medal for gallantry in saving life at sea to George Thomas, fisherman, and a sum of £8 each to John McCarthy, Samuel Hast, John Hall, lighthouse keepers; William Richards, mason; Christopher Ward, James Slater, gardeners; John Jewell, blacksmith; Walter Ackland, shopkeeper; Samuel Randle, James Dunn, and John Lee, labourers, of Lundy Island, in recognition of their services in rescuing the shipwrecked crew of the French steamship *Tunisie*, which was wrecked on the east side of Lundy Island, on the 19th February last.

THE Board of Trade have received through the Consul-General for Sweden and Norway a binocular glass for Frank Harboard, master, a second-class silver medal for John Bennetts, chief mate, and third-class silver medals for John Fisher, Henry Jones, John Hale, John F. Thomas, and Thomas Golding, seamen, of the steamship *Hildegarde*, of London, which have been awarded to them by the Norwegian Government in recognition of their services in rescuing the shipwrecked crew of the Norwegian barque *Hermann*, of Farsund, on the 3rd August, 1891.

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THE Board of Trade have received through the Consul-General for Sweden and Norway the following testimonials, which have been awarded by the Norwegian Government in recognition of the services rendered by the lifeboat *Aldeburgh*, in rescuing, on the 11th November last, the shipwrecked crew of the Norwegian barque *Winnifred*, of Larvik :— A medal of the second class for James Cable, coxswain, and medals of the third class for the crew, namely, W. Mann, John Greene, Charles Ward, George Ward, James Ward, Robert Cattel, George Knights, John Butcher, Robert Butcher, Charles Thorpe, A. Mann, Wm. Wigg, Wm. Crisp, John Downing, Henry Pearce, Thos. Cable, and Thos. Ward.

THE Board of Trade have received through the Consul-General for Sweden and Norway a binocular glass, which has been awarded by the Norwegian Government to Mr. Horatio MacKay, master of the steamship *Umbria*, of Liverpool, in recognition of his kindness and humanity in rescuing and maintaining on board his ship, in April, 1890, the shipwrecked crew of the abandoned Norwegian barque *Magdalena*, of Drammen.

THE Board of Trade have awarded their silver medal for humanity in saving life at sea to John Brooke, skipper of the steam-trawler *Magneta*, of Hull, in recognition of his kindness and humanity in rescuing the shipwrecked crew of the schooner *Jane and Alice*, of Carnarvon, which was abandoned in the St. George's Channel on the 19th February last. The Board have also awarded their silver medal for gallantry in saving life at sea, and a sum of £2, to Caleb Ballard, the second hand of the *Magneta*, who was in command of the boat which rescued the shipwrecked men ; and bronze medals and a sum of £2 each to Henry Timms, third hand, and William Tottle, deck hand, who accompanied him in the boat.

THE Board of Trade have awarded a gold watch and chain to Señor Natalio Borghini, secretary at St. Johns Harbour, Staten Island, South America, in recognition of his kindness and humanity to the shipwrecked crew of the sailing-ship *Crown of Italy*, of Liverpool, which was wrecked off Cape San Diego on the 23rd December, 1891.

THE Board of Trade have received through the Colonial Office a binocular glass, which has been awarded by the Government of Canada to Mr. Edward Guild, master of the steamship *Cyprus*, of Newcastle-on-Tyne, in recognition of his humane and gallant exertions in the rescue of the crew of the wrecked brigantine *Clara*, of Yarmouth, Nova Scotia, on the 30th September last. The Board of Trade have also received a silver watch for Mr. N. F. Sandholm, mate of the *Cyprus*, who was in command of the boat which rescued the shipwrecked crew, and a sum of £2 for each of the seamen who manned the boat, namely—Thomas Barr, John Hartley, Ernest Hicks, and James Embley.

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The Board of Trade have received through the Foreign Office a silver medal and diploma, awarded by the French Government to Mr. Laurence Hennessy, coastguard, Hythe, in recognition of the services he rendered to the shipwrecked crew of the French vessel *Eider*.

The Board of Trade have awarded their silver medal for humanity in saving life at sea to Mr. Francis Harnden, master of the steamship *Peconic*, of Liverpool, in recognition of his humanity and kindness to the shipwrecked crew of the barquentine *Venture*, of Banff, which was abandoned in the North Atlantic on the 3rd March, 1892. The Board have also awarded their silver medal for gallantry in saving life at sea to Mr. W. P. Brownless, first mate of the *Peconic*, who commanded the rescuing boat, and a bronze medal and a sum of £2 to each of the five men who accompanied him in the boat, namely—Antonio Sidotti, Santisi Diego, Luigi Sabatini, Gaetano Chindemi and Pasquali Foca.

The Board of Trade have awarded a bronze medal for humanity in saving life at sea to William Parnell, skipper of the fishing smack *British Queen*, of Ramsgate, in recognition of his services in rescuing the shipwrecked crew of the brigantine *Caroline*, of Faversham, which was abandoned in the North Sea on the 11th December, 1891. The Board have also awarded a bronze medal for gallantry in saving life at sea, and a sum of £2 each to Joseph Huckstep, second hand, and Charles Pottle, third hand, of the *British Queen*, who manned the rescuing boat on the occasion.

The Board of Trade have awarded a binocular glass to Mr. Lucas Grendi, master of the Chilian barque *Reina Margarita*, in recognition of his kindness and humanity to three of the crew of the sailing-ship *Crown of Italy*, of Liverpool, which was wrecked off Cape San Diego on the 23rd December, 1891.

The Board of Trade have awarded silver medals to Auguste Boudard, master; Louis Cyr Xavier Lebon, mate; Jules Frederic Letellier, Auguste Hyacinth Jeanne, Louis René Le Bas, and Adolphe Ernest Lebon, seamen, of the French fishing-vessel *Marthe Augustine*, in recognition of their services in rescuing the two survivors of the crew of the ketch *Wanderer*, of Brixham, in the English Channel on the 16th March, 1892.

The Board of Trade have awarded a bronze medal for gallantry in saving life at sea, and a sum of £1 each, to Alexander MacCuish, senior; Alexander MacCuish, junior; Alick MacCuish, Malcolm MacCuish, Donald MacIntosh, Angus MacDonald, Murdoch MacDonald, Donald E. MacDonald, Archibald Ferguson and Norman Laing, fishermen of Heisker

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Island, Hebrides, in recognition of their services in rescuing the shipwrecked crew of the Norwegian barque *Columbus*, which stranded off Heisker Island on the 4th April last.

The Board of Trade have awarded a piece of plate to Mr. Emanuele Ageno, master of the Italian barque *Marietta D*, in recognition of his kindness and humanity to the shipwrecked crew of the brig *Blanche*, of Cardiff, which was abandoned in the North Atlantic on the 1st November, 1891.

Official Inquiries at Home, 1892.

4524. *Ackworth*, s.s.; built at Stockton, 1889; owned by Mr. J. B. L. Merryweather and others; tonnage, 1,403; Cardiff to Port Said; coal; stranded on north end of Lundy Island, April 20, 1892. Inquiry held at West Hartlepool, May 12, 1892, before Walker and Irvine, Justices; Bain and Bragg, N.A. Casualty caused by vessel being set out of position by the tide, for which no allowance had been made. Nothing was heard of Lundy Island fog-signal although it was being sounded.

4525. *Chippewa*, ship; built at Quebec, 1868; owned by Mr. R. Burns; tonnage, 1,072; Liverpool to Santos; coal, bricks, fireclay and iron; abandoned in lat. 37° 9′ N., long. 16° 43′ W., March 7, 1892. Inquiry held at Liverpool, May 17, 1892, before Stewart, Judge; Cuninghame and Brooks, N.A. Abandonment due to vessel having sprung a leak when labouring heavily in a seaway, which, from her age and condition, and the nature of her cargo, she was not fitted to encounter. Vessel made water to a serious extent when loading at Liverpool, and proper measures were not taken to discover and stop the leak before sailing.

4527. *Forest Queen*, s.s., and *Loughbrow*, s.s.; former built at Renfrew, 1863; owned by Mr. F. Rawson and others; tonnage, 276; Hull to Stockton; purple ore; latter built at Blyth, 1888; owned by Mr. G. Renwick and others; tonnage, 446; Sunderland to London; coal; in collision off Flamborough Head, February 24, 1892, when former sank and 14 lives were lost. Inquiry held at Hull, May 25, 1892, before Twiss, Judge; Castle, Hore and Kiddle, N.A. Collision brought about by *Forest Queen* starboarding when she and the *Loughbrow* were in close proximity, and about two points on each other's port-bow. Master of *Forest Queen*, who was the only survivor of the crew of that vessel, was below at time of collision.

4528. *Viscount*, ship; built at Liverpool, 1873; owned by Mr. J. B. Walmsley and others; tonnage, 1,270; San Francisco to Liverpool; general; stranded on South Reef, Sea Lion Islands, Falklands, March 10, 1892, when three lives were lost. Inquiry held at Liverpool, May 27, 1892, before Stewart, Judge; Wilson, Anderson, and Dyer, N.A. Stranding due to careless navigation. The master shaped a

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course to pass within four miles of Beauchéne Island, and did not use the lead when vessel was supposed to be on Burdwood Bank, although observations had not been obtained for several days. Certificate suspended for six months; recommended for one as mate.

4580. *Jane Fairlie*, barque; built at St. Mary's, Scilly, 1872; owned by Mr. O. Spearing and others; tonnage, 361; London to Straits of Magellan; coal and general; stranded near Zanga Pique, East Coast of S. Patagonia, March 14, 1892. Inquiry held at Westminster, June 10, 1892, before Marsham, Judge; Ronaldson and Baker, N.A. Stranding owing to master anchoring too close in shore, landing in the boat, and leaving an insufficient number of the crew on board to get vessel under way in event of wind shifting, as it subsequently did. Certificate suspended for six months.

INQUIRY BY INSPECTORS, 1892.

50. *Lux*, s.s.; built at Newcastle, 1888; owned by Mr. J. M. Lennard and others; Batoum to Antwerp; refined petroleum; burnt in Doro Channel, Grecian Archipelago, November 2, 1891, when 20 lives were lost. Inquiry held before Mansel-Jones, Majendie, and Hallett, March 5, 1892. Accident due to the ignition in stoke-hole of some mineral oil which had escaped from the trunk or expansion space of cargo tanks, and travelled aft by the port side bunker through the open door in bulkhead of same. The leakage was probably owing to some looseness or failure of the rivets, and the opening of one or more plates during extremely heavy weather. The escape of oil from side bunker into stoke-hole was due to the defective design of vessel, which failed to isolate portions of the vessel into which leakage was possible from other non-cargo spaces. The casualty would not have occurred had the after coffer-dam been continued to the side of ship, and to the upper-deck in the 'tween-decks.

FISHERY INQUIRY, 1892.

S. 62. *Ælfleda* and *Nathan Chapman*, ketches; former built at Whitby, 1884; owned by the Great Grimsby Ice Company, Limited; tonnage, 80; latter built at Grimsby, 1874; owned by Great Grimsby Ice Company, Limited; tonnage, 69; in collision on Dogger Bank, April 26, 1892, when former sank. Inquiry held at Hull, May 26, 1892, before Twiss, Judge; Methven and Davies, N.A. Collision due to *Nathan Chapman*, which was on port tack, having continued her course when she ought to have kept out of the way of *Ælfleda*, on starboard tack, and to latter taking no steps to avoid collision when it became imminent. Certificates of skippers suspended for four and three months respectively. They both left their vessels in sole charge of a deck hand.

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OFFICIAL INQUIRIES ABROAD, 1892.

4526. *Wybia*, s.s., and *Secret*, ketch, in tow of tug *Red Gauntlet*; in collision in River Tamar, December 31, 1891. Inquiry held at Launceston, February 24, 1892. Collision caused by *Red Gauntlet* not carrying proper lights, and by her being improperly navigated. The *Secret* did not exhibit any lights. Costs of inquiry to be paid by the two masters.

4529. *Elginshire*, s.s.; stranded 4 miles S. of Timaru, N.Z., March 9, 1892. Inquiry held at Timaru, March 19, 1892. Stranding due to deceptive current, density of fog, and deficiencies of chart as to soundings. A more complete survey of coast and the establishment of fog-signals recommended.

4531. *Champion*, ketch; foundered off Lake Macquire, April 12, 1892. Inquiry held at Sydney, April 25, 1892. Loss owing to vessel springing a leak.

SHIPMASTERS' SOCIETY, LONDON.

WE have pleasure in reprinting the annual report of this Society. It shows an increased activity in regard to matters affecting our mercantile marine; a desire to spread useful knowledge amongst its members and seafaring men generally, and an ambition to make the Society so representative and influential that it may be regarded as a recognised authority on all questions affecting the Mercantile Marine. Financially, the Society appears to be in a satisfactory position, and many new members are joining :—

"At this the sixteenth annual meeting of the Shipmasters' Society, your committee present the following report for the year. Appended is an audited statement of receipts and expenditure, including that of the Provident Branch, and also the balance-sheet of the Widows' and Orphans' Fund of the Society for the period from 31st March, 1891, to 31st March, 1892.

"On the 31st March last, the number of members on the register, whose subscriptions are paid for 1891 and forward, are 918: 470 masters in command, 312 masters serving as officers, 100 associates, and 36 honorary members; in addition, there are a large number of members who have not reported themselves since January 1st, 1891.

"The 1892 subscriptions of 292 members (267 holding masters' certificates and 25 associates) were outstanding on March 31st.

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"During the year, 60 members holding masters', and 85 associates with mates' certificates, also 3 honorary members, have been enrolled; and the entries are steadily increasing. Thirteen members have been reported dead, amongst them Capt. H. Longley, for several years an earnest and loyal member of the Committee of Management (who would here express regret at their loss); 14 formal resignations have been received and accepted.

"The committee, whilst thanking members for their advocacy of the Society in the past, impress on them the necessity for continued exertion towards the same ends in the future; as a largely increased membership is wanted, if much good is to come of the Society's collective influence.

"On comparing accounts with those of last year, members will notice considerable alterations. Postage, printing, and stationery are much heavier, hire of the telephone is additional, the Secretary's salary has been added to; whilst the enlarged accommodation found necessary has involved the sacrifice of rent. Meantime, the Society's liabilities have been met regularly, and, although the advisability of making some charge for papers has been considered, your committee think it advisable to continue the work as hitherto, at least for the present.

"Two masters in command, and one serving as officer, called before Courts of Inquiry, have been defended. One case occurred in New Zealand, the master's certificate was suspended for three months; but on appeal the Colonial authorities reversed the finding—the certificate was returned and the master took charge of his ship again; with that exception all were exonerated.

"As part of the Shipmasters' and Officers' Federation, your committee have joined in suggesting certain actions to the Board of Trade, with a view to raise the professional status of navigating officers of the Mercantile Marine. The Board of Trade in turn have communicated by circular letter with a number of shipowners, asking for their observations on the subject, and the result is awaited with much interest.

"The Shipmasters' and Officers' Federation are now engaged in promoting a Bill before Parliament, having for its object the exclusion of uncertificated officers and aliens from the command of foreign going British ships, the amendment of the constitution of Naval Courts, and to do away with anomalies attending the right of appeal.

"The Federation are also endeavouring to press forward legislation enabling mariners to record their votes, as members of the Universities do.

"Having constantly before them the prime objects of the Society, your committee do their best to utilize opportunities for helping forward movements which, in their opinion, tend to the welfare of mariners.

"The teaching of sea-cookery to boys in training-ships, initiated by this Society in 1890, is bearing fruit; many poor lads have been started in their sea-life so much the better off. The committee gladly acknow-

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ledge the countenance given to this step by the Home Office and Education departments; and the active sympathy in it of H. Rogers, Esq., Assistant Inspector of Reformatory and Industrial Schools, of Captain W. Scriven, R.N., of the London School Board's training-ship *Shaftesbury*, and of Captain Moger, R.N., of the Industrial training-ship *Clio*.

"Influenced by what had been done by your committee, Miss Calder opened a class at Liverpool for adult sea-cooks. At first it was not supported, but the County Council have lately arranged for a grant in aid; the Shipowners' Associations are interesting themselves, and the classes will shortly be re-opened under encouraging conditions. Meantime, the movement has been quickened by the very costly experiences of an Australian trader. This vessel was forced from her track into a Brazilian port, and heavy disbursements incurred—the reason given being the insubordination and mutinous conduct of her crew, resulting from bad cookery. Thanks to the help of P. Denniston, Esq., and others, the Glasgow School of Cookery for Seamen is now in operation; and on the Tyne courses of lessons, under the Technical Education Committee of the Northumberland County Council, have been instituted and are now running.

"A similar step is on the *tapis* at Cardiff; and your committee confidently expect that a start will soon be made in London at the Sailors' Home, where unrivalled facilities exist.

"Amongst other matters in which members are more or less interested, your committee may state that efforts are being made to obtain the abolition of many Custom House formalities used in reporting and clearing ships, which serve to worry and occupy shipmasters without being useful to the Government; and communications with the Government departments concerned have passed, in reference to teaching boys on board training-ships, the art of using fuel to the greatest advantage, with a view to their becoming efficient stokers.

"Thanks to the invaluable assistance rendered by the St. John Ambulance Association, four classes open to members for instruction in first aid to the injured have been held in these rooms, and one class outside; a number of the students have passed examinations and obtained certificates.

"With a view to reciprocal advantages in arranging classes, and to extend the education range to seaman of all grades, your committee have proposed courses of ambulance teaching to the governing bodies of the Sailors' Home and the Strangers' Home for Asiatics; both have the matter under consideration, and early action is hoped for.

"Opportunities for acquiring a practical knowledge of stability, and requisite shipping business information, &c., are offered to members at the Society's rooms. Your committee recognise a growing desire to compass the general knowledge appertaining to their profession, which is slowly but surely making way amongst officers. Still, there is room for great improvement in this respect.

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"One object kept in prominent position before your committee has been the cultivation of good relations between underwriters, as represented at Lloyd's, and shipmasters, and the placing them in touch with each other.

"Your committee, having in view the convenience of navigators, and, becoming aware of contemplated alterations in the work, have put forward suggestions to the authorities for the publication of a navigators' edition of the Nautical Almanac.

"Suggestions made to the Trinity House were mentioned last year—your committee are still pursuing the subject. They are more than ever convinced of the necessity for providing means by which to mark the coast-line in times of thick fog, when the ordinary light and sound-signals fail. The *Eider's* disaster, happily unattended with loss of life, was a costly object lesson bearing on the point.

"The action of some philanthropic agencies—some reports from official sources, and the Plimsoll agitation—have, within the past few years, very much influenced the press, and ill-informed popular opinion, to the serious detriment of shipmasters. Sharing "blood money," assisting crimps, and other foreign port sins against sailors, have been freely alleged against them.

"These assertions have given your committee much concern; with a view to sift the statements, and to bring out the truth of them, a correspondence was opened with, and information upon the several points has been collected from, typical ports; it goes far to show that shipmasters (however weak some of them may have been) are by no means the greatest sinners.

"Sufficient proof has been afforded to make it certain that in some cases the servants of philanthropic bodies, consular agencies, &c., have been equally to blame, and that the sailors are their own enemies.

"This condition of things is noticed for the sake of warning members and shipmasters generally, of the great discredit brought upon their brethren, by practices of the kind; and in the hope that for the future their non-participation in such fraudulent doings will be obvious.

"On the first of January last the Shipping Federation issued a "Benefit Certificate" intended for, and offered to, the masters, officers, and seamen of that large number of steamers and sailing-ships with which it is connected. There are features of the book as it stands to which exception is taken, but the committee hope these will be removed.

"Up to March 31st, papers have been read and discussed on Practical Navigation; Boat Lowering and Life Saving Appliances; The British Mercantile Marine; Heating of Ships and Cargoes and Waste of Heat in Steamers; Ocean Meteorology; Shipping Stability; The Compass—Historical, Theoretical, and Practical, and others are promised on Ship Sanitation; Merchant Shipping Labour, in Port and at Sea; Meteorological Forecasts of British Islands; Lighthouses, Lightships, Lights, Sound-Signals, and other Aids to Coast Navigation; Captains' Expe-

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riences in Government Shipping, and Consular Offices; Maritime Law, in Connection with Mariners; and a continuation of the British Mercantile Marine series. Members are solicited to help in making these papers and discussions valuable, and to contribute their experiences by letter or otherwise; also, by preparing papers on subjects with which they are conversant. The following are suggested:—Ship Ventilation; Ship Manœuvring; Constructive Details of Ships, with Reference to Safety, Convenience, and Hygiene; Jury Rudders, and Make-Shift Appliances for Ships and Steamers; Modern Marine Insurance and Lloyd's Agents; Petroleum in Bulk and its Dangers at Sea; The Royal Naval Reserve, and the Reciprocal Duties of the Force and its Authorities, &c.

"The number of officers who find employment through introduction from the Society is steadily increasing.

"The list of honorary agents to the Society is being extended. Several gentlemen, located in ports abroad, have lately accepted the position. In all cases members are advised to make their acquaintance, and to call on them when requiring advice or to pay subscriptions.

"PROVIDENT BRANCH:—Mrs. Cutler, the representative of the member reported dead last year, generously handed the proceeds of her claim to the Widows' and Orphans' Fund.

"The WIDOWS' AND ORPHANS' FUND is growing slowly but surely. Two widows of members, left with young families in needy circumstances, have been helped by pecuniary assistance, and your committee gratefully tender their sincere thanks to contributors who have supplied them with means.

"On behalf of the Society your committee beg to record its thanks for hydrographical and meteorological notices, official reports, etc., regularly supplied by the Admiralty, the Hydrographic Office, Washington, the Marine Survey and Indian Wreck Department, Calcutta, the Board of Trade, the Meteorological Office and the Corporation of the Trinity House.

"The committee would also thank Messrs. Barclay, Bevan, Tritton & Co., bankers, for their gratuitous services to the Society from its commencement.

"The Committee of Management, on presenting this report, bring to an end their task for the past year. In accordance with the rules their seats are vacated; being eligible, they offer themselves for re-election, and if again entrusted with the duty, will use their endeavours to forward the best interests of the Society."

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NOTES.

THE able American yachting paper *Forest and Stream* has recently been advocating a uniform racing rule for yachts. As the case stands at present, some few American clubs use a rule depending upon length alone, while most use the Seawanhaka rule of length and sail area. The English rule of length and sail area differs considerably from the American, but it has the advantage of being pretty generally used in England. One Transatlantic club, the Royal Nova Scotia Yacht Squadron, uses the English rule.

THE "Seawanhaka" rule dates from 1884, and is known as the rule of "corrected length." In it the length on the water line is added to the square root of the sail area, and the sum divided by two gives the so-called corrected length in lineal feet. The sail area is measured from the spars, club topsails not being included.

IN the English Y.R.A. rule of 1887 the result obtained is known as the "rating." The length on the water line is multiplied by the sail area and the product divided by 6,000, this factor being chosen in order to give numerical results not differing greatly from the tonnage by the old rule. In this method of measurement the sail area is calculated from the sail plan, such topsails as are carried being included in the measurements.

SOME American yachtsmen have started a movement for abandoning the Seawanhaka rule which has, up to the present, been pretty generally adopted. Against this our contemporary energetically protests, taking up the position that "it would be better on the whole that all clubs should use one poor rule rather than that half a dozen better rules should be in simultaneous use."

THE mean length rule expressed by the formula

$$\frac{\text{Length on Deck} + \text{Length on Water Line}}{2}$$

is used by the New York Yacht Racing Association, to which several clubs belong. It is not used on the East Coast or in Canada by any clubs outside the Association, but is the rule in

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favour with a few clubs in the West. The great majority of the clubs on the Atlantic Coast, and also those on the Great Lakes, use the Seawanhaka rule.

THE summer meetings of the Institution of Naval Architects will be held this year at Cardiff, on Tuesday, 19th July, and the three following days. This is the first time that the Institution has held meetings at the commercial capital of South Wales.

The case of the stranding of the *Ackworth*, on the north end of Lundy, on the 20th of April, draws prominent attention to the fact that, though the fog-signal on Lundy was actually being fired during the period in which the vessel struck, it was not heard by those on board. It is true that the Court do not mention this fact in their judgment as contributing to the casualty, but, nevertheless, it is quite possible that the master may, to some extent, have been trusting to hearing the signal. It has so often been reported to the Trinity House that stations have been passed without hearing their fog-signals that the Hon. Corporation has, in many stations, fitted automatic "tell-tales" which record each sounding of the signal. This of itself shows how little reliance can be placed on hearing such signals *without fail*, and it may be well to again call attention to some warning remarks issued as long ago as 1881, by Mr. Arnold B. Johnson, Chief Clerk of the U.S. Lighthouse Board, which have at times been reprinted in this journal and other nautical papers, and which are still of as great importance as ever, and are emphatically reiterated in Todd and Whall's *Seamanship*. They are as follows:—

"When approaching from windward the fog-signal is picked up earliest aloft; from leeward, on deck. Do not assume that you are out of hearing distance because you fail to hear the signal, nor that you are at a great distance because the sound is faint, nor that you are near because you hear it plainly.

"Do not assume that you have not reached a given point in your course because you do not hear the signal with the same intensity as on some former occasion.

"Do not assume that the signal has ceased sounding because you fail to hear it even when within easy earshot.

"Do not assume that the aberrations of audibility are the same in different fog-signals.

"Do not expect to hear the signals as well as usual when the upper and lower air currents run in different directions, or when wind and

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tide do so, or during a time of electric disturbance, or when the sound must reach you from over an island or point of land.

"When there is a bluff behind the signal, be prepared for irregular intervals in audition, as would follow were the sound to ricochet like a cannon ball; thus you might hear it at 2, 4, 6, 8, &c., miles; and lose it at 1, 3, 5, 7, &c., miles, or at any other combination of distances, regular or irregular.

"Until the laws governing these aberrations are evolved, and a method is discovered by which the irregularities can be corrected, you will do well, when you do not get the expected sound of a signal, to assume that you do not hear the warning that is, nevertheless, faithfully sounded, heave your lead and use other means to make sure of your position."

Possibly, if sufficient caution had been exercised on the lines here suggested, this stranding would not have occurred.

THE Marquis of Dufferin and Ava was installed as Lord Warden of the Cinque Ports at Dover on the 22nd ult. Much old world ceremony was expended in the function, representing something of the past glory of the Ancient Cinque Ports. The appointment itself has, in these days, but little significance —it is a reward of merit for public service—and probably no nobleman deserves the recognition so well as he upon whom the honour is now conferred.

THE Royal Commission on Coast Communications has after some unavoidable delay been appointed. The names of the Commissioners are:—The Earl of Mount-Edgcumbe, President; Sir E. Birkbeck, M.P., Admiral Sir G. S. Nares, Admiral Sir L. M'Clintock, Mr. Mulholland, M.P., Mr. R. Munro Ferguson, M.P., Mr. J. Cameron Lamb, Mr. E. Graves, and Mr. J. A. Kempe, with Mr. Garnham-Roper, of the Board of Trade, as Secretary. We believe this Commission has before it a much harder task than is popularly imagined, and we think it probable that no practical outcome will be forthcoming for a considerable time. It is noticeable that the official element outweighs what may be regarded as the popular element.

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CANADA'S GREAT LONE SEA.

THE navigation of the waters of Hudson Bay and Straits as a practicable commercial route for the transport of produce from the North-West Territories of Canada, is a question that is now creating much attention. The extraordinary increasing yield of the harvest with each succeeding year requires an outlet from that country other than by rail, the facilities of which means of transport are already taxed to their utmost, and now leave on hand in the country large quantities of grain unshipped. A few years ago, the Canadian Government equipped an expedition for the purpose of ascertaining the actual condition of the Straits during the summer, the length of time available for navigating them, and wintering parties were left at several stations to report on the ice and its movements, open water, tides, climatic conditions, and meteorological data during that season. The result of this was a Blue Book or two, with an able report from Lieut. A. R. Gordon, R.N., in charge of the expedition, and a geological report from Dr. Bell, of the Geological Survey, who accompanied that expedition. There the matter rested, and since then nothing has been done to utilize the information so obtained. As the waters in question

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are very little known beyond the small circle of the officials of the Hudson Bay Company, whose ships make annual trips from the Orkneys, with supplies for York Factory and the other forts and posts in the northern wilderness, or by an occasional adventurous skipper of some American whaler, or fishing-vessel plying its avocations in the Bay, the following sketch may be of interest.

The little that, until quite recently, was known respecting this great northern inland sea of Canada and its surroundings is, that in 1610, Henry, or Hendrick Hudson, an English navigator, entered the Bay, in his ship the *Discoverie*, expecting to find the looked for North-West Passage to the China Seas, one of the great objects of adventure in that age, and that failing in this, he was cast adrift by his mutinous seamen, in a small boat or pinnace, the fate of which was never ascertained. The waters he had sailed thus became his tomb, and in the name they have since borne, his epitaph. After the occupation of Rupert's Land by the British, it must have been looked upon as a strategic point of importance from the fact of a very large and strong fort having been erected in a commanding position (at the mouth of the Churchill River, where it discharges into the Bay), which in its day mounted forty guns. This was surrendered, without firing a shot, to the French Admiral, La Perouse, in 1772, who spiked the guns, blew up some thirty feet or more of the ramparts, and did other damage, for which the British Government presented a nice little bill for France to settle. A number of dismantled guns still lie among the ruins of "Fort Prince of Wales," which Dr. Bell styles "probably the largest ruin in North America."

In 1845, Admiral Sir George Back stated, before a Committee of the Imperial House of Commons, that if he had anything to convey to Red River (the Winnipeg of to-day), he would unquestionably prefer the route *viâ* York Factory. This fact also did not escape the eagle eye of the Duke of Wellington, who, in 1846, placed in Fort Garry, by means of boats on the Nelson River, and subsequent water communication through Lake Manitoba, a detachment of 400 rifles, in less than 30 days from York Factory, where they had been landed. Although in the popular mind, Hudson Bay is apt to be associated with the Arctic Regions, no part of it lies within the Arctic Circle, the latitude of its southern extremity being south of London. An adequate conception of its extent, including James Bay, at the south, may be formed from the fact

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that its total area is some 500,000 square miles, or nearly half that of the Mediterranean Sea; that it measures about 1,000 miles in length, and that it is over 600 miles wide in its northern part. The principal channel is 500 miles long, with an average breadth of 100 miles. The numerous groups of islands along its eastern shores are surrounded by deep water; the depth over the Bay is uniform, averaging 70 fathoms throughout, deepening to 100 or more in approaching the Straits, whilst in the latter it varies in the centre from 100 to 300 fathoms, the latter being the deepest sounding. The bottom consists of boulders, clay, and mud. Near the shores a stiff clay, affording good holding ground for anchorage, is almost invariably met with on both sides. The latter are high and rocky, but the northern is less precipitous than the southern. The Bay itself is the great central basin of water drainage of the northern part of the continent from the centre of the Labrador Peninsula on the east, to the Rocky Mountain range on the west, whilst from a point near latitude 45°, the waters flow from every direction, and discharge by one great outlet—the Nelson River—into the Bay. Dr. Bell asserts that the whole extent of territory drained into Hudson Bay approaches three millions of square miles, over the greater part of which extends a temperate climate, with large tracts of fertile soil. Of the other rivers flowing into the Bay, thirty are of considerable size. Those from the east run parallel to each other, being progressively smaller towards the north, a fact due to the height of land in Labrador lying further inland towards the south; on the west coast the Albany and the Churchill are the longest rivers, but the Nelson discharges the largest volume of water in a course of 400 miles, combining as it does the waters of a number of rivers from the south, and it is the only muddy river that enters the Bay. The Churchill is beautifully clear, somewhat larger than the Rhine, and with a rocky, deep and comparatively narrow mouth forming a splendid harbour, which can be entered with ease and safety by the largest ships at all stages of the tide, thus offering every advantage for shipping, and its entrance is destined some day to be the main commercial point of this inland sea. The drawbacks to most of the other rivers as harbours are the bars outside. The average rise and fall of the tide on the west coast is from eleven to twelve feet. Few of the rivers afford uninterrupted navigation for large vessels to any great distance from the coast. During the season of high water, shallow draft steamers might ascend the

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Moose River for upwards of 100 miles, Hayes River 140 miles, and the Albany nearly 250 miles, but large steamers might ascend the Nelson River for 70 or 80 miles from the sea.

This Great Lone Sea, situated in the heart of British North America, and actually possessing a seaport in the centre, 1,500 miles nearer than Quebec to the fertile lands of the North-West, begins to possess a new interest to Great Britain, seeing that the future highway to the west may yet pass through it. York Factory, which is actually nearer Liverpool than New York, has been styled by Professor Hind the "Archangel" of the west, but the mouth of the Churchill may more fitly challenge that title. A glance at the map of the northern hemisphere shows the shortest route between the North-West Territories and England is through Hudson Bay. A close calculation of relative distances, made in the Canadian Department of the Interior, shows Winnipeg lying at the extreme south-eastern portion of these territories to be at least 800 miles nearer to Liverpool by the Hudson Bay route than by the St. Lawrence, while the difference in favour of the former increases continually as we advance north-westerly into the interior. This saving in distance represents economy in time and money, or in freight and passenger rates. Owing to its cooler and more uniform temperature, this northern route, besides shortening the distance, would afford greater advantages, especially as regards the live stock of the western ranches. And, what is of the greatest importance, an inlet by Hudson Bay is the only thoroughly independent channel which can ever be established between Great Britain and her North American possessions.

Previous to the report of Lieut. Gordon's exploratory expedition, an impression prevailed that on account of ice, navigation for the ordinary purposes of commerce was impossible through the Straits. He, however, very plainly sums up his observations as follows:—"Whilst I am of opinion there will always be more or less fluctuation in the date of the opening of practical navigation for the purpose of commerce, the shipowner who sends in a freight carrying steamer before 15th July, will almost certainly be subjected to such delays as will add very materially to the cost of the voyage. In estimating the period of navigation of an ordinary year, I should say from 15th July to the 15th October, with a possibility of navigation from 1st July to 1st November, and later than the 15th October the risks of navigation are so

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increased, that the question of insurance would in all probability settle the date."

Lieut. Schwatka, of the United States, who spent two years up in the north-west of Hudson Bay in search of the relics of the Franklin Expedition, says: "From my experience, and conversation with navigators who had spent many years therein, I think the Straits and Bay would be considered navigable for at least two months for sailing craft, and this would probably be more than double for steam. Of course the Bay is navigable much earlier and later than the Straits, and the above estimate is for the latter." Again, a ship, "strengthened for the ice, might prolong these times considerably, and signal stations on prominent points could also materially assist vessels assaying the passage, by a simple code expressing the condition of the ice."

Much of the ice encountered in the Straits consists of the giant bergs brought down by the Arctic current from the Humboldt and other glaciers, and field ice from the Arctic Sea coming down the east Greenland coast, together with all that come down Davis Straits. The current from the latter flows west along the north shore of the Straits, its set probably terminating at the east side of Salisbury Island, whence it takes an easterly course along the south side of the Straits. A mass of Arctic ice outside, pens up the ice in the Straits till the end of June, when it tends southward, and the Hudson Straits ice is then free to pass out, and disappear under the influence of the rising temperature of both air and sea. The tidal currents in the Straits flow with great rapidity, especially at the eastern end about the Buttons' Islands, and at the western end, near the Digges Islands, causing the ice to whirl in every direction. The records of a number of voyages made by the early explorers of the seventeenth century and of a later date, all testify to the presence of broken ice during July in the Straits, but broken sufficiently to make it safe for working through.

The uncertainties of the tidal currents in these waters, defying the calculations of the navigator, is instanced in the case of Captain Parry's expedition in 1821, with the *Fury* and the *Hecla*, when on the 6th July these ships were close together in the ice, and on the following morning the *Hecla* had drifted eleven miles from her consort, without any breeze. Considerable fog hangs over the Bay in the months of July and August. Safety in thick weather lies in the constant use of

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the lead, and keeping a bright look-out, as the dead reckoning is frequently in error to a considerable extent. The most serious difficulty is the faulty work of the compass, especially off Digges Island, at the western end of the Straits, where the magnetic pole is approached and the dip of the needle is 86°. This means great vertical force, with the horizontal force approaching the vanishing point. "The latter may be considered," says Lieut. Gordon, "as that portion of the earth's magnetic force which determines the direction of the needle, when counterpoised to hang horizontally; the vertical force is that by which induction in the iron of the ship to a great extent affects the deviation or ship's errors." In making a voyage from Great Britain to Hudson Bay the dip changes from 67° to nearly 87°. The practical meaning of this is, that supposing a residual error of one degree left uncorrected on one of the cardinal points when adjusting before sailing, this would —since the deviation changes with the tangent of the dip— have become an error of 6° when the ship had gone to a place where the dip was 87°.

As the mouth of the Churchill River, emptying into the Bay at an angle in the coast lying between Cape Churchill and Seal River, offers the finest harbour in these waters, the following description from official sources may prove valuable:—At its mouth the river flows nearly north, the estuary is narrow, being only some 600 yards wide. Here the tide runs with considerable velocity, estimated at half-tide to run six knots. The basin for anchorage, with a depth at low water of over four fathoms, is about 1,500 yards north and south, by about 1,000 yards east and west. The holding ground is good, the bottom being mud, and though the tide runs rapidly the harbour is pronounced an eminently safe one. The approaches are well marked, and in clear weather the land stands out bold and high, being easily identified at a distance of ten or twelve miles. In thick weather the rule for making the harbour is to steer W. by S., keeping in 20 fathoms of water. If shoaler water is met with, haul up to the north at once till the water deepens again. The harbour is well adapted for a railway terminus, as the necessary docks could be easily and cheaply built and the deep water basin enlarged at small cost. Stone lies at the water's edge ready to be laid into docks, or piers, and nature seems to have left little to be done to make this a capacious port, capable of doing business on a large scale.

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Port Nelson, where is situated York Factory, the great *entrepot* in years gone by of the Hudson Bay Company, was selected, not because of any harbour facilities, but because the Hayes River, which enters the Bay on one side of the tongue of land on which York Factory lies, was the best boat and canoe route to and from the interior of the country, a route which was the only means of communication with the early settlers of Red River and Selkirk settlements. The Company's ships on arrival could not come up to the fort, owing to shoals, but discharged their freight into schooners in the outer roads, ten miles from the nearest land, which lies so low as to be out of sight from a ship's deck, the only distinguishable object being the Point Marsh Beacon, which towers up 80 ft. above high water, and without which it would be impossible to make the anchorage even in clear weather. This condition of affairs practically precludes Port Nelson from ever being used as a commercial harbour.

Apart from the question of the navigability of Hudson Bay as a practicable route for the transport of grain and produce, its resources are great and capable of far more extension than they have yet received. In fact, a few New England whalers and the Hudson Bay Company have had everything in their own hands. Whale and porpoise fishing, walrus hunting, salmon and trout fisheries, and rich mineral resources, offer advantages in a comparatively new field. Water-fowl abound, of which ducks of all kinds, geese, the trumpeter swan, which breeds on the islands off the east coast, loons, curlew and plover are the most common. The coast and islands of the bay are the main breeding ground of these birds, where they have been undisturbed for centuries and unapproached by man. On the land, as far as the limits of trees and brushwood extend, grouse and ptarmigan are in abundance. Large game is well distributed, and of bears, in addition to the polar, another species frequents the "barren grounds" south of the Straits, the skin of which so closely resembles that of a grizzly as to pass for a variety of the latter in the trade. Dr. Bell, the geologist, accompanying the Canadian Expedition in 1884, mentions a very curious fact. His party killed on Digges Island, on September 16th, a she polar bear and two cubs, the stomachs of which were found to contain nothing but partially masticated grass. About four quarts of this were present in the stomach of the old bear, and two and a-half, and one and a-half quarts respectively in the

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stomachs of the cubs. The Eskimo, and Hudson's Bay Company's servants, informed the party that these bears are in the habit of occasionally using grass for food. Whether this is from preference, or from the want of small game is doubtful, but in the case here recorded it could hardly have been from the latter at that period of the year. The musk ox is found only on the north-western shores of the Bay, principally round Chesterfield Inlet. Before the Eskimo obtained firearms from the Hudson Bay posts in trade, they used in the chase the bow and lance, the former made of two or three sections of musk ox horn, tipped with the shorter horn of the reindeer, and lashed with its sinews. The barren ground cariboo is the commonest of the large game found on both sides of the Bay. Its migration is notable, for spending the winter along the border of the low forests southwards, it travels north on the approach of spring. Its quiet grey colour so closely assimilates to the "barrens" that it is no easy matter to sight it at once, and the sportsman should approach down-wind. The cariboo is to the Eskimo what the reindeer is to the Laplanders; but the numbers annually killed for the sake of their tongues, which are shipped to the London market, is materially thinning their ranks, and they may eventually share the fate of the bison.

Whaling in Hudson's Bay has, according to Lieut. Gordon's reports, for many years been carried on by United States vessels, chiefly from the ports of New Bedford and New London. The voyage is made in comparatively small vessels, and occupies about eighteen months. Leaving their New England Port in June, they make their way to Marble Island on the north-west of the Bay, arriving there some time in September, and going into winter quarters. As many as four whalers at one time have wintered there, and on Deadman's Island, appropriately named, a long row of graves bear testimony to the trials and hardships these men undergo in pursuit of their calling. After wintering, the vessels are cut out early in June, cruise about the Bay till August, and leave for home in September. A table was published in 1887 by Lieut. Gordon, showing that, in the twenty-five years preceding, 113 United States vessels, engaged in whale fishery, had visited Hudson's Bay, the total catch of which was 1,620 barrels of sperm, 56,019 barrels of whale oil, and 900,063 pounds of whalebone, whilst during that period 16 vessels engaged in the trade were lost.

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Comparing the above catch, and that the average size of the vessels is only 240 tons, the margin for profit is considerable. Vessels such as these, however, are only a risk, and must class as fishing-boats, being in no way adapted for any other purpose than what they are engaged in. But the vessels recommended as practicable for the purpose of commerce must be, not the cheaply-built freight steamer, but vessels of about 2,000 tons gross, fortified for meeting ice, and of such construction as to enable them to be fair freight carriers. They must be well strengthened forward, should have wooden sheathing, and be very full under the counter. The propeller should be of small diameter, and well down in the water. A limit of 2,000 tons is stated, as a larger ship would be unwieldy, could not make such good way through loose ice, and, being unable to turn sharply, would get many a heavy blow that the smaller ship would escape.

Already several railways are projected from different points in the North-West to Hudson Bay, notably one from Winnipeg and another from the Calgary and Peace River districts, over which much of the grain and a large portion of both American and Canadian cattle from the western ranches would be carried, and European goods for those districts would furnish return freight. The recent completion and opening of the Edmonton and Calgary Railway is rapidly filling up a very important agricultural country, and the near proximity the Hudson Bay route would afford to European markets, will extend its benefits to the south of the boundary line. A railway running south-west from a port on the Bay will materially alter existing conditions, and its extension, as proposed, into the United States or to connect on the western frontier with the American railway system of the Western States, will be productive of a large traffic both ways. Cold storage accommodation already exists at Calgary in connection with the shipment of frozen meat in refrigerator cars to the Pacific coast, a trade which has far exceeded the expectation of its promoters. With the shipbuilder and capitalist rests the solution of the problem of this new line for commerce to take, and if such parties will construct and equip vessels suitable for the route, not on the lines of the ordinary ocean freight steamer, but specially adapted for ice and northern waters, there is every reason to believe that such an enterprise would prove remunerative and successful.

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That this great Lone Sea will become to North America what the Baltic is to Europe, is only a question of the near future.

WILLIAM SMITH,
Deputy Minister of Marine and Fisheries of Canada.

Ottawa, 25th June, 1892.

THE PERSONNEL OF OUR MERCHANT SERVICE.

IS the Merchant Service of Great Britain able to protect itself and safeguard its own interests? The question is a somewhat vague one, but a seaman writing to seamen may perhaps take liberties with his definitions, which would be denied to one who was endeavouring to attract the attention of a more critical audience; by this is meant not that seamen will necessarily put up with any degree of slackness in argument, but that they are apt to discover that which is worth recognition, and to relegate that which is not strictly practical to the position it merits.

Whether the subject-matter here dealt with will prove practical or visionary is a question which must be solved as it progresses; but it is hoped that the opinions here expressed will be accepted by seamen in the spirit in which they are written, and that the endeavour of the writer will be understood not as tending to promote discord, but to draw somewhat closer together a service which has so many interests in common; and not only that: in addition to its own interests its value to our country is not one that can be stated in figures; the potential mood must be employed if any idea on such a subject is to be formulated.

It is not the intention to deal with the *matériel* of the Mercantile Marine in this article. That is a question which is being discussed frequently in these pages, and by men who are well qualified by both knowledge and experience to handle it in a manner which shall do it justice. The *personnel* is here dealt with—seamen, officers, owners—and the matter is by no means an easy one to tackle. Let us start with the seamen.

At the present time there is a great disposition on all sides, whether one looks to Australia, New Zealand, America, or

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Ireland, to preserve the advantages each country possesses for the use or benefit of its own inhabitants. Great Britain alone pursues its policy of unrestricted free trade, and although the wisdom or otherwise of this course is still a matter of debate in England, yet, judged by the results of a limited protection in some of our Colonies, there is a great deal to be said in favour of a reconsideration of this matter by ourselves.

By doing so in an impartial spirit, it will require no very great acumen to recognise the fact that money circulated amongst ourselves, in our own country, is put to far better use from a British point of view than when it is paid to a foreign country for a commodity of which we ourselves possess a superfluity—if only the proper means are adopted to place it on the market.

And this matter is one of considerable importance to the inhabitants of the United Kingdom at a time when the common outcry on all hands is a want of employment for strong men willing to work: a cry which, we may reasonably suppose, will never become less clamorous under present conditions of labour. We, of our own free will, or through callous indifference, yearly send or give away from our own working classes a sum which is not easily computed, but still is one which in magnitude is of very considerable importance even to a nation as wealthy as ourselves.

The position of Great Britain amongst other nations is an extremely curious one. Compared as to size with some of its European rivals, to say nothing of America, the contrast is laughable, and it is scarcely possible to avoid a certain amount of wonderment when one considers the world-wide sway exercised by the Government of so small an island. How came it about that, in the words of that glorious old song:—

> "The Briton may traverse the Pole or Zone, and boldly claim his right,
> For he calls such a vast domain his own, that the sun never sets on his might."

The answer is simple and easy. We, as a nation, possessed certain advantages owing to the mineral productions of our country; but our success must be mainly attributed to the fact that our population took naturally to salt water and a seafaring life; also must it be considered that we have been masters, though not undisputed masters, of the sea for the last hundred and fifty years, and maritime power is a thing which is apt to increase by the very reason of its own success. If this latter

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remark is doubted, it may suffice, perhaps, to say that ordinarily speaking the greatest number of ships will support the largest sea-going population.

We have also grown so accustomed to the contemplation of our command of the sea, that we have assumed, apparently, that no one will ever seriously dispute with us the accuracy of our ancient and time-honoured tradition. Had it not been so, our Navy would scarcely have been permitted to dwindle to the dangerous and ineffective limit it had reached seven years ago.

The Briton, however, nowadays can no longer "traverse the Pole or Zone" and claim his right as it was understood when those words were written; when the British Empire was forming, his right meant everything he wanted that he could lay his hands upon. Whether it was property or territory, mattered little, and there have been instances of men who, finding themselves abroad without a ship, have borrowed one without much ceremony from a friendly nation, when they felt strong enough to do so, with impunity.

It must certainly be admitted that we, as a nation, have been very successful at this game of "grab." There is very little of the available world now left unpartitioned amongst European nations; and consequently the first part of the game is now over; each player is now looking at that which he has, and also taking a good look at the spoil which has been accumulated by his neighbour. This stock taking, if it may be so termed, is not carried out by our neighbours in any spirit friendly or well-disposed towards Great Britain. Indeed it may be said without fear of exaggeration that by certain countries we are partly feared and wholly detested as a nation; and that this state of things is so will scarcely be denied by anyone knowing the world from practical experience; but, however this may be, it cannot be overlooked that the secret of all our success has been that we, since our empire commenced to form, have had to a greater or less extent the command of the sea. Without that our conquests of territory would have been impossible, and this was never more plainly demonstrated than in the East Indies, where at times the French were in almost or quite equal force to ourselves. Had we not finally got the command of those waters, we could no more have conquered India than we could have landed our last expedition to Egypt.

Few people will be found to maintain in argument that the position and power of Britain will last longer than our naval

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supremacy; in fact, it may be said that as a nation we are ship-builders and shipowners first, and all other success is consequent upon our possessing the largest and best establishments in existence for the manufacture of maritime *matériel.*

Still the fact remains, that no matter by what means we have possessed ourselves of this Empire, we have it *now;* and whether our power for retention of territory is equal to that displayed for its acquisition is a question which the future only can decide.

The bare contemplation of a defeat at sea is not a subject that an Englishman cares to expend much time over. It is a thought which will arise at times, and is regarded as some hideous nightmare to be forgotten as quickly as possible, for no one seriously contemplates an invasion of our country as being practicable. This is the outcome of the confidence which is universally reposed in the Navy, and, seeing that this is so, and that defeat at sea means irretrievable disaster for us, ought we to leave undone the smallest thing which could possibly conduce to our safety? Naval warfare now is a new and untried experiment, and few men could predict with even an approximate estimate of truth the result of the next great naval action; but, assuming for the sake of argument that in a big fight there was one solitary surviving ship, would not the advantage remain with the country which had the greatest number of seamen to fall back on? Although the more elaborate fighting machines were destroyed, warfare would be carried on with perhaps less complicated weapons, but still such as could be wielded by the less trained men upon whom the duty of using them would devolve.

Now when the next great continental war begins, does it seem in the least degree probable that we shall be permitted to stand and look on, increasing in wealth and power by the very struggles of our neighbours? It is scarcely probable; and we may reasonably expect to be called upon to show that we have both the power and inclination to protect that which is our own. Of all the European nations, at the present time we are the solitary instance of a power whose territory is not one vast camp, and is not put to a tension almost unbearable to maintain intact its rights and the integrity of its own soil. The British taxpayer growls, but on the whole is well content with this state of things, and, in the firm belief that all is well with the Navy, goes to bed comfortably. He is very fond of his Army, too, and likes to see it make a show,

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but the feeling for it is entirely different to that entertained for the Navy. John Bull knows that his Army frequently gets a reverse at the commencement of a campaign, and waits with fairish equanimity for the turn in his favour, which he knows is bound to come. But not so with his Navy; if it were hinted that the Navy might meet with a reverse, he would say the thing was impossible. And so say we all; but is it altogether realised even by themselves, let alone the general public, that enormous trust and confidence are reposed in naval officers. They are placed in a position in which they *dare not* be beaten, and considering that the total number of men in the Navy is about 60,000, with a Reserve of about 22,000, a greater compliment could not be paid to their training, and the powers they are expected to display when called upon for action. They are expected to maintain the supremacy of our power at sea and our very national existence, and proud should they be, from the admiral to the last joined youngster, when they think that they so carry the faith of their countrymen. Still, the strength of the Navy, as given above, is certainly none too great for the enormous responsibility resting upon it.

It is, of course, an understood thing that in time of war or national emergency every seafaring man may be called upon to render active service in defence of his country, though it is extremely improbable that the press-gang will ever again be a necessity. It has been stated on good authority that the Reserve of the Navy has within it nearly every suitable A.B. of the Merchant Service. By this it would appear that we have no great number of British seamen to fall back upon supposing they were urgently wanted during any national emergency. The foreign seamen who habitually sail in British vessels cannot possibly be regarded as efficient substitutes for our own countrymen if required to fight in a quarrel in which perhaps their own nationality was concerned.

It is scarcely possible to avoid making the foregoing remarks, as showing the manner in which this subject is of interest even to the Royal Navy as well as the Merchant Service, and, consequently, affecting the strength of the country. It is intended to look at the question solely from the Mercantile Marine point of view; but it is now, and has been in times past, extremely difficult to separate the common interests of both services.

It is necessary to enquire whether any advantage is gained by the employment, on a large scale, of foreign seamen and

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officers, or if we in any way benefit by this practice. It is difficult to understand that we do so in the smallest degree.

There is no doubt that Scandinavian seamen are, as a rule, fairly quiet and well-behaved up to a certain point, beyond which, they are capable of excesses which any British crew would stop short of. As far as their training as seamen is concerned, they are, perhaps, superior to many British seamen, and this may be accounted for by the fact that the greater part of their lives has been spent in sailing-vessels, their various countries as yet not possessing the steam fleets necessary to cause their deterioration as sailor men pure and simple. But all evidence taken on the matter goes to prove that in times of emergency, our own countrymen possess by far the greater aptitude for extricating themselves from any scrape they may have had the bad fortune to become involved in. The very qualities for which Swedes, Danes, and Norwegians are praised, namely, that they are more submissive and amenable to discipline, are not altogether an unmixed blessing; for if management only is required to work with our own countrymen, our own officers ought to be able to exercise the necessary control, and if they cannot do this, the remedy is to be found in their better and more complete training for the work they have to do. But the fact is this, that our countrymen are accustomed generally to better living and treatment than any nation under the sun, not alone in England but in our Colonies, where the status of the working man leaves little to be desired. Take, for instance, a German domiciled either in London or the Colonies. He can live on far less pay than an Englishman, and will be content to accept occupation and pay which one of our own people could scarcely live on, and it is in consequence of this that the foreigner is so often chosen; there is less trouble with them about food and living accommodation.

It must not, however, be imagined that our dietary scale on board ship is, or even has been, such as to hold up as an example. American ships twenty-five years ago were far better provisioned than were ours, and at perhaps less cost. Our Board of Trade scale now is a fairly expensive one; but more suitable food could be obtained for a very slight increase of money; but if it had not Government sanction it would never satisfy Jack. There is no denying the fact that to get the best results from an Englishman, or rather Briton, he must be well fed. A hungry man is a disappointed being. Naturally so;

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and your discontented man is the one who gives trouble and is the shipowner's bad bargain. It has been the writer's experience in his younger days to have gone through the mill in a most thorough and complete manner as far as the hardships of a seaman's life are concerned, and looking back on this experience, he affirms that nine times out of ten rows on board ship were caused by one of two things, and they were drink and bad feeding. The remaining tenth might be placed to the score of bad characters amongst the crew, or weakness or misconduct on the part of the officers.

But if that was the state of things twenty-five years ago, it is scarcely so now. The drink question as one factor of disturbance at *sea* may be left out of the discussion, as it no longer exists, except in the case of passenger vessels, where Jack gets it from the passengers; even then it is scarcely worth comment, as with a strong executive the maintenance of order is simply a detail. "No spirits allowed" is seen on almost every set of articles, and that settles the drink question as far as salt water is concerned. On the other hand, it has been the fashion of some shipowners to pat themselves on the back on account of their ships being what they termed temperance ships, which meant that they saved the money once expended in grog and gave no equivalent for it. It is not contended that this was universally so, but it was of frequent occurrence; and when a man had been hours aloft in bad weather, a glass of grog was a comfort, which the cost of the galley fire prevented his experiencing in the shape of a cup of coffee, which, so often proposed as its substitute, is rarely a reality.

It will perhaps be generally conceded that Jack on shore is no longer, taken as a class, the man of fifty years ago, any more than he is at sea. Circumstances have altered—environment, if it may be so termed—has made its mark even on the seaman of to-day. Steam has wrought the inevitable change by rendering unnecessary that dash and fearlessness aloft which was the pride of the naval man, as it was equally the necessity of the merchant seaman. To go back to the time of the Crimean war, even when sails were making their last and best expiring efforts in their hopeless struggle against the unwelcome and hated steam-engine, the seaman ranked among his fellows in a very great measure according to his activity and fearlessness aloft. The rivalry between many vessels was such, that on occasions when parties of men from various ships met on shore, they fought over the respective

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merits and smartness of their vessels, until serious damage was inflicted mutually. It is needless to say that drink was in a great measure responsible for this state of things, which would be an unheard of occurrence in the present day, if for one reason only, which is that the man-of-war's man of to-day is in many cases an abstainer from intoxicants, and is altogether another being to the Jack of a generation since. But, if this change has taken place in the Navy, it must not be imagined that the Merchant Service has stood still in the matter of improvement in morality, although it may be admitted that total abstinence voluntarily is not practised to the same extent as in the Royal Navy. At sea, with few exceptions, it is compulsory; on shore it is not so, and it is owing in a great measure to this reason that so many complaints are made as to the conduct of merchant seamen. But if the acceptance or otherwise of grog in the Mercantile Marine were optional, as it is in the Royal Navy, the merchant seaman might also become an abstainer from choice; because it is denied him at sea, he naturally, like the child he is, makes a run for a surfeit of forbidden fruit directly he gets on shore. Is it natural or otherwise?

Still, in a concern as vast as the Mercantile Marine of Great Britain, there are many and various grades, and it would be impossible to classify them all under one standard. The one thing that stands out pre-eminently is this, that in the vessels where care is taken to select good men, and, furthermore, to treat them properly when secured, the evils which are so bitterly complained of are reduced to a minimum. It would be an invidious and ungrateful task to particularise any particular line or group of ships for comment on this subject. But the fact remains that where, through necessity, it has been found necessary to get good men, those men are always forthcoming. But all bargains have two sides, if they are to stand the wear and tear of practice. In this particular one the shipowner wants good men, and goes to some trouble to get them; on the other hand, Jack wants a good ship, and knows perfectly well when he has got one. This is a fair instance of give and take.

If, on the other hand, a shipmaster or owner's representative goes to a street corner, and picks up the first men that come to hand, then taking them on board ship to a filthy forecastle, and all that makes the comfort of their lives in a similar condition, what is or can be expected from these men?

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They are treated with the least consideration permissible by law; is it to be wondered at that as little as possible is done in return? It reminds one very much of a passage in one of Robertson's plays, "School," I think, where a girl says, "Is that all they gave you to go there to fight?" and the man replies, "Well, you know we did not do very much work for it." It is not pretended that the quotation is accurate; but it is near enough for practical purposes, and illustrates exactly the case in point.

Of course it will be urged that the majority of shipowners cannot afford to take special care of their men and to go to the expense necessary to do that which is commonly called "pamper seamen." This is altogether wrong, and is, moreover, an altogether false argument for these reasons:—

a. The conditions of a seafaring life are not those of any other calling.

b. The old-fashioned idea that the seaman was a brute, and required the treatment of such to keep him in order is a thing of the past.

c. The value of labour at sea is of far more importance than any similar labour on shore.

(*a*.) This is one of those self-evident facts that, by reason of their very plainness, are at the first touch difficult to handle; there are so many points to lay hold of, that one does not know where to begin or what may be said of sufficient importance to give any one fact its place or importance before a dozen others.

In a paper which preceded this, the condition of Mercantile Jack was compared with that of a mechanic on shore—training for training and wage for wage. The conclusion there arrived at was that the mechanic was 10s. per month the better off of the two, *plus* his ability to go to his home nightly and enjoy himself in a rational manner. This comparison is, however, scarcely fair to the seaman. Human life has its commercial value precisely the same as almost any other commodity. What is there that money will not buy? Tommy Atkins values his life, apparently, at something under 1s. per diem and his keep. It would hardly do to venture on detail in this matter, but the fact remains that recruiting does not seem to flourish at that price, and hence the talk which has arisen as to pay and emoluments shows very conclusively that the British private considers that he does not receive that which he thinks to be his fair market value; but save in war

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time his life is that of a gentleman compared with that of Mercantile Jack.

Perhaps the fairest contrast that can be made is that between the seaman and the miner, for both live under conditions which are exceptional, and both, to a certain extent, carry their lives in their hands. Perhaps in the matter of recklessness there is little to choose between them, and the doom of both is at times both swift and sudden; but the miner's working hours are short, his pay is good, and he has lots of spare time for relaxation and enjoyment. Compare his life with that of a seaman in an ordinary cargo steamer, where perhaps there are four hands in a watch, which, with one at the wheel, and one on the look-out, leaves two to do any necessary work that crops up; his wretched food and miserable lodging, and the utter absence of the smallest detail at sea which could make life worth living; amusement may be left out of the question. It is unnecessary to detail the life; it is known to every seaman; and bad as it is for the men, it is little better in many cases for the officers. On the other hand, in a good ship fairly manned, and all hands properly fed and treated, there is little to complain of. Just one detail will be mentioned here as a case in point. Of course there are many who will say that a bath for seamen or firemen is an unnecessary luxury. Well, judged by a very ancient standard, it may be so; but, working as seamen do amongst all sorts of dirt frequently, if they do not keep themselves clean, the ship has usually to bear the expense of their being laid up or sent to a hospital, which will soon run into the expense of a bath. As to the firemen there can be no argument on the matter. It has been found necessary to see the men wash when leaving the fires in the Navy, and it is none the less so in the Merchant Service. Perhaps if these men lived on shore in their own sphere, they could wash annually if they pleased, and no one but themselves be the worse for it; but as a matter affecting the interests of the shipowner, the health of seamen must be attended to. That cannot be done unless the facilities for cleanliness are provided, and it forms no unimportant item in the maintenance of good discipline, of which there can be none where men habitually live in dirty quarters. This matter of cleanliness is only one point of many which could be noticed as illustrating the varying conditions of labour at sea and on shore, and these separate conditions should as far as possible be maintained. The plan adopted in some steamers of giving

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the men a weekly wage to find themselves, is one of which little can be said in its favour. It may answer well from an owner's point of view, but in practice the men are without proper necessaries.

(*b.*) Next, as to what Jack is and what is the amount of discipline required to keep him in order. There is a lot to be said on this matter, but it may, generally speaking, be all resolved into this: That an officer, to govern men, must first be able to govern himself; that a bad crew may be managed by good officers, but the best crew in existence is soon spoiled by bad ones. It seems somewhat out of place almost to mention such an elementary matter as the treatment of seamen; but from one cause and another there is very great room for improvement. If all ships in the Merchant Service were the same socially, and had the same class of officers and men, it would not be difficult to dismiss the matter in a few words; but as they are not, and their crews differ widely in addition, the matter in its detail becomes complicated, though still to be judged by one very simple standard. Do the men get through their work efficiently and quickly? That question embraces the entire subject. The general impression of the writer upon this is that there was never a time when men did their work more willingly than now; but in professional ability they have fallen off in consequence of what may be termed the decay of sailoring, as apart from going to sea for a living. They, as a rule, are lamentably ignorant of anything beyond a pot of paint or a deck scrubber, and if a job of rigging work has to be done, it is difficult sometimes, even in a big ship's company, to find men to do it decently. On the other hand, officers will maintain that it is no business of theirs to teach their men; the absurdity of which is evident, for if no one is to teach, how is the necessary knowledge to be retained in the service.

That which is requisite in the treatment now is the same as always has been necessary, viz., firm, consistent behaviour on the part of officers, and this from the commencement of the voyage; but the outlook is not a hopeful one, there are so many difficulties to be encountered before a satisfactory state of things can be arrived at, that one naturally hesitates to put one's hand into a hornet's nest, so perhaps this particular matter of discipline had better be dealt with when the relations of masters and officers are under discussion. This much is certain, that if a better type of seamen is required,

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the educational standard of officers will have to be dealt with first, and this will be no easy matter.

(*c.*) In the first part of this paper, our comparative strength at sea has been noticed both with regard to a national emergency and the importance of the British Mercantile Marine as a money-earning machine. These are points which it is necessary now to notice.

It will be admitted that ships cannot be sailed without men. Very well; our seafaring population is not enough to man our own vessels without the assistance of foreign seamen. If we are involved in war at any time with a maritime power, our ships must keep the sea to bring supplies into the country, or the country is starved into subjection. This argument may be said to be chimerical; but it will be difficult to prove it so.

Great Britain owns, roughly speaking, seventy per cent. of the tonnage of the world. In the event of a war, say with France and Russia combined, how is trade to be carried on if the greater part of that seventy per cent. of vessels are to be laid up on the outbreak of war, whether that laying up is caused by our inability to protect them, *or* by reason of our insufficiency of seamen to man them? Sailing-ships being, of course, laid up on any outbreak of hostilities, a great many seamen would thus become available for steamers, but they would be foreigners in a great measure, and it is possible that foreigners might be found willing to accept the risk; but by far the greater probability is that they would return to their own countries, which countries would naturally endeavour to get possession of our vessels at disadvantageous terms to ourselves. It is doubtful whether France would recognise such transfer after a declaration of war under any conditions, and that, perhaps is a fortunate thing for us, for if once the carrying trade leaves our flag, it is gone for ever. America is a case in point. They have not recovered yet, and it is doubtful whether they will, from the effect produced by *four* insignificant raiders. In the event of a war with France and Russia, that four could be multiplied fifty times, and very pretty sport each one of those vessels could have, and will have unless means are taken to prevent it. There was a discussion a short time since at the Royal United Service Institution whether merchant vessels were liable in the event of war to be torpedoed indiscriminately; and it appeared to be a doubtful matter. But if it is so, our vessels will scarcely induce foreigners to take risks which must be fairly encountered by our own countrymen. Here then is

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the case, for vessels must keep the sea; they will do so at a great risk—the supply of foreign seamen will be at least a doubtful matter. Under these conditions, can the value of any hundred thousand working men on shore be compared with this number of British seamen?

It will doubtless be said that if in times past we have been unable to furnish a sufficiency of British seamen to meet our own requirements, what hope have we of being able to do so in the future?

The answer to this question must be on these lines. The Navy, and a seafaring life generally, is popular amongst our countrymen. The recent Naval Exhibition has proved this conclusively; and now is our time to take advantage of this feeling in favour of a seafaring life, and obtain recruits for a calling that until now has been little understood, and in addition has suffered from two distinctly opposite causes, both of which are in reality equally fallacious.

On the one hand the sea has been wrapped in a halo of romance which has made it seem, perhaps, visionary and unreal, and consequently has suffered when the truth has been learned by experience of possibly a painful character. On the other, it has been vilified and abused in a manner which, until recently, has made even the Royal Navy seem a hot-bed of tyranny and oppression, and the Merchant Service a calling far worse in all its different grades than any which can be chosen on shore. As has been said in another article, if there were anything necessarily brutalising in a sea-life, this could be understood; but as the reality is not so, and as it is shown that shipowners and seafarers are indispensable for the welfare of the British Empire, it is high time these misconceptions were removed, and steps taken to alter the existing state of things in this respect.

It may be granted that the race of seamen—as seamen were understood in sailing-ship days—is extinct; they have become so in consequence of their being no longer a necessity. What is wanted now is a seafaring population of *our own*, who will be accomplished enough in nautical skill to meet the requirements of steam navigation.

It must not be imagined for one moment that it is here the intention to detract in the smallest degree from the value of the thorough training and education of a seaman; it is believed, on the other hand, that what may be termed the instinct of a seaman is invaluable; but that is a quality which was bred by

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masts and yards only, and can never be acquired in either steamers or mastless vessels. It is, therefore, rapidly becoming a thing of the past, and in future the men who go to sea and get into a mess will have to save themselves, as has been done in times past, by the use of such wits and ability as Providence blessed them with. But sailoring in the old sense, as apart from seamanship, must be left out of the question.

And the curious part of it all is that admitting, as everyone will, the dearth of British seamen, it is incredible the difficulty there is in finding a ship for boys who express a preference for a sea life; it is an enigma which is difficult to solve, and an explanation of it has yet to be forthcoming. It is said that the apprenticeship system does not work. It is devoutly hoped that the attempt to restore it will not be made when it is too late; but this much may be regarded as certain, that, without Government interference of some sort, no improvement will be made. It is a case that calls urgently for it, and, if taken in time, can be satisfactorily dealt with; the longer it is delayed, the greater will be the difficulty.

As the only test of the truth of this assertion, the Naval Reserve must be regarded as a Government interference with the Merchant Service. Will anyone seriously contend that this has not done an incalculable amount of good? Except when class has been set against class by reason of strikes and vicious leaders, any disturbance is rare amongst a crew of Reserve men. And a time of strikes is no fair test of the normal behaviour of men; it is not fair to take isolated cases of misconduct as the type of a body of men whose conduct taken as a rule may be considered extremely good.

It would be manifestly a mistake to conclude this article without reference to that most important modern factor in maritime affairs—the Shipping Federation. I quote here from an article in the *Globe*, date unknown, and entitled "The Shipping Federation Programme":—"It would be an insult to common sense to suggest that the movement was set on foot for any philanthropic motives. The Federation is purely a business institution from beginning to end, and is run in the interests of trade. If it is prepared to spend thousands of pounds in the protection of the working man, that is because it recognises that master cannot do without man any more than man can do without master, and that this being the case, sympathetic and proper relations between them are essential."

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Just so; that is the very gist of all the argument; but without the strikes it is at least doubtful whether the Shipping Federation and its advantages would have existed. There is, however, an old proverb on the subject of looking a gift-horse in the mouth, which is applicable here. From a seaman's point of view the rules of the Federation are good; the commencement of a system which may ultimately lead to continuous discharges is not one to make light of; and it is to the advantage of all decent mariners to encourage it by every means in their power; but "the Federation is a business institution from beginning to end." Well, all business institutions require to be watched carefully. This one up to the present has done an immense amount of good. It has for a time, at least, quieted discontent in the shipping world in a great measure, and let it continue the work it has so well begun, and, before pressure is put upon it, go thoroughly into the question, both for the benefit of "master and man," since the one is necessary to the other.

The subject is a large one, complex in its details, and far-reaching in its interests. It has been shown that both from national, economic, and vital reasons the Mercantile Marine and its welfare is of the greatest importance to our country, and inasmuch as a foundation is a necessity for any building to be raised upon, so in any argument must one begin at the bottom of the ladder, and afterwards endeavour to climb. Jack is near the step of the ladder, and these pages have been devoted to him.

WM. CAIUS CRUTCHLEY, Master Mariner.

THE BUREAU VERITAS.

IN recent articles on *Lloyd's** and *Lloyd's Register*,† it was stated that *Lloyd's* furnishes information to underwriters with regard to the movements and employment of ships and the accidents which may happen to them. *Lloyd's Register*, on the other hand, collects and distributes information as to the ship herself, her original construction and present condition; and it is as a necessary means to obtaining accurate information on these points that

* *Nautical Magazine*, February, 1892.

† *Nautical Magazine*, March, 1892.

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the whole system of surveys and rules has grown to its present dimensions. *Lloyd's Register of British and Foreign Shipping*, as indicated by its title, deals with foreign as well as British shipping, but while it may be said, on the one hand, that a very large proportion of the ships built in the United Kingdom are built under its inspection and rules, so a very large proportion of its total work is with ships built in England. Roughly speaking, the relation of the tonnage built in England to the total tonnage built in the world, is about the same as the relation of the shipping built to class in Lloyd's to the grand total built.

The functions performed by Lloyd's in the United Kingdom are in other countries partly in the hands of national registries, by which is meant registries taking the names of the countries to which they belong, partly in those of a great international Society known all over the world and named *Bureau Veritas*. The Society of Bureau Veritas was established on July 1st, 1828. It is thus older than the existing Society of *Lloyd's Register*, which was formed in 1834, but not really older than the Institution which had been previously carried on by other societies. Veritas had its home in the first instance in the city of Antwerp, and was started under the patronage and with the assistance of King William I. of the Netherlands, who advanced twenty thousand florins to its promoters, repayable in twenty-five years. Such, however, was the success of the Society, that the loan was repaid in ten years. The first name of the new Society was "Bureau de Renseignements pour les Assurances Maritimes," and its object was stated to be to furnish information about the ships which frequented the ports of the Netherlands. After a year it took its present name of Bureau Veritas. In answer to a question as to the origin of its name, M. Charles Bal, who was Director of the Society for forty years, and who gave evidence before the Royal Commission on Unseaworthy Ships in 1873, said:—"Our Society is called 'Veritas' because an institution of classification should only represent what is the truth." The female figure holding a torch, which forms the design of the seal of the Society, is also explained as being emblematical of the truth, exposed and unadorned. On the proper performance of these functions, the investigation and the statement of the truth about ships, the success of the Society depends. It is not like *Lloyd's Register*, a body formed by underwriters and shipowners, and governed by those who are

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directly interested in the proper performance of its work. Veritas is, as M. Charles Bal stated on the occasion we have just referred to, a private institution, whose growth and development are owing to its acknowledged usefulness and probity.

When the Society was founded in 1828 Belgium and Holland formed the kingdom of the Netherlands, which had been created by the Congress of Vienna in 1814. In 1830 a revolution broke out in Belgium, and the city of Antwerp fell into the hands of the insurgents, except the citadel, which was held by the commandant of the city. He, being exasperated by a breach of a flag of truce, commenced a bombardment of the city, and, seeing that troubled times were coming, the authorities of Bureau Veritas carried away their records to Paris. The citadel of Antwerp continued to be held by the Dutch garrison while the city was held by the Belgian revolutionary authorities for nearly two years, and thus it was that the Society became established in Paris, where its business was carried on and its registers were published, until, for a second time, it had to migrate in consequence of a war and a siege. It has been a consequence of the long stay of Veritas in Paris that it is often spoken of by shipmasters as French Veritas, or even as French Lloyd's. At one time there was a maritime register at Bordeaux, but at present there is no distinctly French society apart from Veritas.

In France there had existed for many years a system of official surveys of shipping, but the survey had been made under conditions which deprived it of its value. The local tribunal of commerce nominated two surveyors to visit the ship when she was ready for sea, and in foreign ports the French consul ordered a similar survey; of course, the cargo being on board, a survey of such a character could be of little real value.

About the year 1855 it was the case that nearly all the French Mercantile Marine were classed in Veritas, and shipowners began to express dissatisfaction with an inspection to which they submitted voluntarily, as compared with the official inspection which was compulsory. We in England, who only ask for Government intervention when all other means fail, can hardly understand the position of the French shipowners, who actually petitioned the Government to suppress Veritas and to substitute the ordinary official survey of the Government for that of the Society. A commission of inquiry

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was appointed by the Government, and the conclusion arrived at was, that Veritas did its duty, and that it was not advisable for the Government to interfere with its operations. The Government, as the result of the inquiry, put forth a declaration replying to the Chambers of Commerce, that if Veritas did not exist it would be necessary to create it; and it was on that occasion that its director, M. Charles Bal, was named Chevalier of Legion of Honour. The struggle went on for fifteen years, and an Imperial Minister, M. Rouher, sensibly replied on one occasion to a request by the Chambers of Commerce for the suppression of Veritas:—"So long as shipowners complain of Veritas I shall be quiet, because I shall consider that Veritas is doing its duty; their complaints are really great praise." From that time the French Government have frequently conferred honourable distinctions upon the directors and surveyors of Veritas, in recognition of the important public services performed by them, although they are the servants of a private society. In this respect the conduct of our own Government affords a marked contrast to that of France. They have been glad to avail themselves of the skilled service of Lloyd's surveyors on Royal Commissions and on committees, but there has never been any public recognition of their gratuitous and valuable services.

In 1851 Bureau Veritas issued rules for the construction of wooden ships. The scantlings were based upon the register tonnage. At that time the present system of tonnage measurement was not in use in England, but it was introduced in the Merchant Shipping Act of 1854. The Act of 1854 contained a clause, providing that if other countries adopted the English system of measurement the tonnage shown on their national papers would be recognised in England. It was, however, not for some years that other nations adopted the English rules, and the present international system of tonnage has been of slow growth. The method Veritas adopted for some time was to take the tonnage for each ship classed by them, as measured by the system in use in her own country, in fact, the tonnage shown upon her national papers; but it was found that considerable practical difficulties arose from this. Thus, a vessel might be built, which, if registered in the country where built, would be under a thousand tons, but being sold before completion, is registered under another flag and measures over a thousand tons. Thus, if registered where built, the vessel's scantlings would be sufficient, but if registered in another

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country they would be too small. Obviously, some other system was necessary, and accordingly we find in the rules for 1872, that the scantlings were to depend upon the number obtained by multiplying the product of the length, breadth, and depth, by seven-tenths:—

$$\text{Scantling number} = L \times B \times D \times \cdot 7.$$

This is an approximation to the under-deck register tonnage measurement expressed in cubic feet; in other words, the scantling number divided by one hundred gives approximately the under-deck Moorsom tonnage.

The system of classification adopted by Veritas is of a somewhat intricate character, and its present nomenclature has arisen out of similar circumstances to those to which we adverted in our remarks upon *Lloyd's Register*. We then referred to the fact, that if a series of classes be constituted for ships, it gradually comes about that the lower classes cease to have much value and fall out of use, and there being still the necessity for a number of distinctions, new intermediate classes are constituted. Thus, the old *Lloyd's Register* societies started with classes A, E, I, O, and U. When the present *Lloyd's Register* commenced in 1834, the two latter vowels were dropped, but an intermediate class, known as Æ, was formed. Gradually the E and I classes have become obsolete, and another intermediate class between A and Æ has been formed, known as the Red A.

So the Veritas started with the idea of classing ships by a series of fractional numbers, unity or 3.T., otherwise 3/3 was the highest class; 5.S., otherwise 5/6, the next; then 2.T. or 2/3; and, lastly, M. (*moitié*) 1/2. In the register for 1863 we find ships described as of three classes, each having two divisions: the first-class including 3/3 1-1, and 5/6 1-1; the second, 5/6 2-1, and 3/4 2-1; and the third, 2/3 2-2, and 1/2 3-2. These numbers are still the designations of classes for wooden ships; but the last set are obsolete, and even the class 3/4 2-1 is of rare occurrence. The fraction 3/3 or 5/6, as the case may be, is the general name of the class; the division in the class is shown by the figure next following, and the last figure refers to the rigging, sails, anchors, and outfit generally. New wooden ships are classed for a term of years, depending upon the material of which they are built, and such vessels have the character 3/3 1-1. When the original term is run out they may be continued in the same class for a fraction of the original

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term after undergoing certain prescribed surveys, which we need not here describe in detail. At a certain stage the vessel drops down to the character 5/6 1-1, and under certain circumstances, after a further term, to 5/6 2-1. The surveys required for each class are laid down in detail in the book of rules for classification.

The classification of ships is rendered somewhat more intricate in Veritas, by the fact that in addition to the classes just named vessels have qualifying marks indicating that they are classed for various trades. These marks are as follows:—

1. I. (Intérieur.) Vessels especially built to navigate canals and rivers.

2. P. (Petit Cabotage.) Vessels intended for short voyages.

It may be remarked in connection with these letters that Lloyd's also class vessels for river service only, for channel service only, or, in some cases, for towing purposes only; but in such cases the qualification of the class is stated at length in the register book.

3. Y. (Yachting.) Vessels intended for pleasure sailing.

Lloyd's Register, as is well known, deals with this class of vessel by the issue of a separate yachting register.

4. G. (Grand Cabotage.) Great coasting trade, for which the vessel must be above 70 tons register.

5. M. (Méditerranée.) Vessels especially built for voyages in the Mediterranean, and presumably not fit for general seagoing purposes.

6. A. (Atlantique.) Navigation of these vessels is limited to the Atlantic and seas opening into it. Vessels classed for it must be over 100 tons, and must be sheathed with metal.

7. L. (Long Cours.) Vessels which may go to all parts of the world. They must be not less than 250 tons register, and must be metal sheathed.

The qualifying letters follow the main statement of the class in the Veritas register book. Preceding it is a column stating the number of years for which the vessel is classed, also the maximum number to which she would be entitled when new, from the material of which she is built. Thus 11—8 in that column tells us that the vessel belongs to the eleven years type, but is classed for eight years only.

The number of years of the type is determined by the material of which the vessel is built. In the early history of

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ship classification Veritas, which in many matters has been content to follow *Lloyd's Register*, found one opportunity of leading. This was in giving a fuller recognition to the superior kinds of American spruce fir as a material for shipbuilding. After the better kinds of coniferous wood, such as hacmatac (the American larch) and red pine, were used up, the Canadian shipbuilder had to turn to spruce, and Veritas, by their prompt acceptance of that material for ships of a good term of years, gained a footing in the British North American colonies, which it still retains. It was in connection with Canadian shipping that the then director of Veritas gave evidence before the Royal Commission of 1873. The Commission had before it Mr. Plimsoll's proposals that all British vessels not classed in Lloyd's should be subject to periodical survey by the Board of Trade, and the owners of colonial wooden ships were anxious that a similar exemption to that proposed for Lloyd's should also be given to ships classed in Veritas. In connection with this the Board of Trade of St. John's, New Brunswick, petitioned the Governor-General of Canada to move in the matter, urging that "as the greater portion of the tonnage of the Dominion of Canada is classed in a society known as *Bureau Veritas*, it follows that the exclusion of vessels so classed from being recognised by the fifth section of Mr. Plimsoll's Bill will be an act so very unfair and wholly unjustifiable, that our Dominion shipowners will either have to submit to the arbitrary terms of the Act, or be forced to put their vessels under a foreign flag, in order that they may, in common with foreign vessels, be exempt from the provisions of this Bill." The Bill, as is well known, did not become law, and we quote the above in order to illustrate the position attained by Veritas in regard to Canadian shipping. In consequence of this connection and also of the longer survival of wood shipbuilding on the Continent, especially in countries such as Italy and Norway, which have large native supplies of shipbuilding timber, it is still the case that the part of Veritas devoted to sailing-ships still much exceeds that occupied by steamers. The Society, however, has always been abreast of the times in its connection with iron and steel ships.

At first Veritas prescribed scantlings for iron ships on the basis of their register tonnage, and classed them for terms of years. Classes were granted to the new material with some caution, the terms of years being seven, five, and three. In

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the book for 1868 we notice three classes for iron ships, with distinctive marks $\underset{12}{A}$ $\underset{9}{A}$ $\underset{6}{A}$. The classes were dependent upon the thickness of the plating, and the scantlings were still based upon tonnage. In the book for 1873 we notice the same marks for iron ships and pretty nearly the same system of determining scantlings which exists at present.

Before describing this in detail, it is necessary to notice a second migration of the headquarters of the Society, again caused by a siege. On the investiture of Paris by the German Army in 1870, the authorities of Veritas adopted the precaution of removing their records to Brussels, and for some years the headquarters of the Society remained in that city. The Board of Administration sat in both Paris and Brussels for some time, and for many years the publications of the Society were printed and published in Brussels. Ultimately, however, the administration of the Society was re-established in Paris.

The classification of iron ships in Bureau Veritas has been based upon a uniform system for the last twenty years. The character 3/3 is given to all iron and steel vessels in a perfect state of repair, the character 5/6 to vessels in a less satisfactory condition. The numbers following the 3/3 indicate: first, the state of the wooden parts of the hull; second, the state of the equipment. Three numbers are used, 1, 2, 3, indicating the various degrees in each case. Thus a vessel 3/3 1-1, would be one of which the iron was in good condition, also the woodwork of the hull and the equipment. Iron ships are not classed for terms of years, but are subject to certain periodical surveys. They are classed in three divisions, depending upon their construction. The first division I. and the second II. are so arranged with regard to the scantlings. Alternate strakes of plating in the bottom and sides are one-sixteenth of an inch thinner in II. than in I. In small vessels a wider spacing of frames is also admitted in the lower class. Division III. includes ships not built under Veritas rules, but considered by the administration to be worthy of that class. The mark ✠ before the division character indicates that the vessel was built under special survey.

Iron ships have the same qualifying navigation letters, which have been already referred to, in describing the classification of wooden ships. There is a further mark however in the case of

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some iron and screw vessels. P. R. (Proue renforcée) indicates that the vessel has had her bow strengthened with a view of navigating through ice.

There is also a modification of the divisional marks, which we will describe in the words of the rules:—"Steel or iron vessels which are divided in a sufficient number of watertight compartments to keep the vessel afloat in case of a serious leak arising in any one of the said compartments, shall be inserted in the register-book with one of the following marks:—

(I) For the first division.

(II) For the second division.

(III) For the third division."

Before granting this mark, the authorities of Veritas require a complete plan of the various compartments, together with the calculations of the longitudinal and transverse stability, supposing one of the compartments to be filled with water. A maximum load-line must also be fixed for the vessel.

To ascertain that a vessel is so divided, that she is of the first division of the highest class, has her woodwork and equipment in good condition and is to be classed for voyages to any part of the world, it is necessary to see that she is classed in the register-book as follows:—

(I) 3/3 1-1. L.

We have already described the numbers regulating the scantlings of wood ships built to Veritas class as the approximate under-deck tonnage measurement in cubic feet given by the formula:—

$$L \times B \times D \times \cdot 7.$$

This is also the number regulating the plating and other longitudinal parts of the structure in iron and steel ships. The number regulating the scantlings of frames, reverse frames, and floors is obtained by adding the breadth and depth:—

$$B + D.$$

In one and two-decked vessels, D. is the depth of hold, allowing only the floor plate of the size given by rule. In three-decked vessels, the depth is reduced by an amount equal to half the height of the upper 'tween-decks, but is never made less than 18 feet. In spar-decked vessels the depth of

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hold is measured to the main-deck, and so also in the case of vessels corresponding to Lloyd's awning-decked vessels, but known in the Veritas rules as *hurricane-decked* vessels. Increases for extreme proportions are made upon much the same system as in Lloyd's rules.

In connection with the use of steel for shipbuilding, Veritas made a series of experiments in 1878 on Bessemer steel, manufactured by the "Société John Cockerill," of Seraing, Belgium. On these were based the rules for the testing of steel issued by them in the following year. These do not differ materially from the rules promulgated by Lloyd's and the Board of Trade for the same purpose. The reductions allowed in the first instance for the use of steel differed from those allowed by Lloyd's, which it may be remembered were 20 per cent. on all parts of the structure. Veritas allowed 18 to 25 per cent. upon the outside plating and other longitudinal parts of the structure and upon the plating of bulkheads, but only 10 to 15 per cent. upon the thickness of floors, of angle-irons and bulbs.

In a few years, however, they, like Lloyd's, issued separate tables for scantlings of steel ships. In these the scantlings are not like those of Lloyd's rules for steel, expressed in twentieths of an inch, but in thirty-seconds of an inch.

It should be mentioned that there is a note in the rules published by Veritas, to the effect that the tables of scantlings for both iron and steel ships are applicable to vessels having the navigation marks G. A. and L., that is, to vessels in the "great coasting trade," and longer sea voyages. On the other hand, vessels intended for the "small coasting trade," for Mediterranean service only, for yachting, or for inland navigation, may be constructed on a different scale, but the specifications and scantlings have in each case to be submitted to the Society.

One peculiarity of Veritas rules is, that to meet the case of iron of superior quality being frequently used on the Continent in shipbuilding, they have established a system of tests for this material similar to steel tests, and have a separate table of scantlings for ships built of it. Steel is required to have an ultimate tensile strength of twenty-seven to thirty-two tons per square inch of section. Common iron is assumed to have a minimum strength of twenty tons with the fibre, and superior iron is supposed to have a strength of twenty-two tons per square inch with the fibre. In the case of superior

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iron being used, the metal has to be as rigorously and systematically tested as is required in the case of steel.

The increase of steel shipbuilding of late years on the Continent, as well as the large number of steel ships built in Great Britain for continental owners, has caused a large increase in the number of steel ships built to Veritas class. In one class of vessels especially, steamers built to carry petroleum in bulk, Veritas has been well to the front. On looking through the register-book, it will be seen how many of these vessels are classed in Veritas, and one also remarks that many of them have complied with the bulkhead condition, and have the distinguishing divisional mark (I).

Composite vessels are classed by Veritas, and have the same distinctions of classification as iron and steel ships, but their divisional marks are indicated by the characters

C I C II C III

which stand for the first, second, and third classes respectively.

Engines and boilers have of late years been surveyed by Veritas, and detailed rules are laid down for their construction and for the testing of the material of which they are composed. No character is granted to vessels propelled by steam, unless the machinery is periodically surveyed by the Society.

Veritas, like Lloyd's, has a scale for anchors and chains depending upon the approximate tonnage as ascertained for their plating number, but with the addition of half the cubic content of spaces on deck. In the testing of anchors and chains, the proving establishments which are sanctioned by the Government in this country have their certificates recognised by Veritas everywhere. In addition to these, the certificates of the Norwegian Royal Marine Establishment at Horten are recognised, and there are establishments at Leiden and in Bouches-de-Rhône, France, where tests are made under the direct supervision of Veritas surveyors.

For the testing of chains only, Veritas, by its surveyors, supervises operations at five other testing-houses in France, one in Belgium, and one in Boston, U.S.

Bureau Veritas being in its constitution a private society, and being public only in so far as it performs public functions, it is impossible for us to describe its constitution in the same way that we were able to describe *Lloyd's* and *Lloyd's Register*. Its administration is in the hands of a Board of

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Directors in Paris, eight in number. It has a technical staff at its offices in Paris, of whom the chief is Mons. L. Piaud, an engineer and naval architect, trained in L'Ecole Polytechnique, Paris. Alterations in the rules, which are necessary from time to time, are discussed by a technical committee of the chief surveyors. This Committee consists of twenty-six members, who are widely scattered, and hence it meets at somewhat long intervals. In the early part of its career most of the surveyors of Bureau Veritas were retired shipmasters; but at the present day its staff is recruited from technical engineers and shipbuilders. Its officers take the various titles of Inspector, Surveyor, Engineer Surveyor, and Assistant Surveyor. Of these there are as many as 30 in the United Kingdom, and about 140 on the European continent, 16 in the United States, 6 in British North America, 17 in other parts of America, 18 in Asia, 3 in Africa and 6 in Australasia. When the Load-Line Act was passed in 1890, provision was made for the assignment of load-lines to British ships by various technical authorities. Two of them were specially named in the Act, the officers of the Board of Trade and Lloyd's Register, and provision was made for the appointment of others by the Board of Trade. The first to be so appointed was Bureau Veritas, but as it was necessary that the work should be done in England, Veritas constituted a special freeboard committee meeting at Liverpool. In the current year's Bureau Veritas register-book this Committee is for the first time designated as the British Committee of Veritas.

Figures, given in the number of *Lloyd's Register* just issued, enable us to compare in some way the magnitude of the operations of the two chief societies for the registry of shipping. Lloyd's classes are held by 3,007 sailing-vessels and 5,257 steamers, giving a grand total of 8,264 vessels. Veritas classes are held by 5,020 sailing-vessels and 1,252 steamers, giving a grand total of 6,272. It must, however, be remembered, that these figures are those of the numbers of vessels merely, and that the average tonnage of the vessels classed by Lloyd's would much exceed those classed by Veritas. Further, a much larger proportion of the vessels classed by Veritas are wood than of those which hold Lloyd's class. At present, 4,319 iron vessels and 2,649 steel vessels are classed in Lloyd's, whereas 1,001 iron vessels and 559 steel vessels are classed in Veritas.

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The Bureau Veritas were first in publishing a list of the shipping of the world, classed and unclassed. Lloyd's commenced a Universal Register in 1887, but as long ago as 1870 Veritas started with the annual publication of their *Répertoire Général de la Marine Marchande*. This work is now issued in two volumes; the first contains the names of all sea-going sailing-vessels over 50 tons register, the second contains all sea-going steamers of over 100 tons register. The name of the master is given, also that of the builder and of the owners, the place and year of construction, the port of registry, the signal letters, the system of construction, the tonnage, rig, principal dimensions, and horse-power in the case of steamers. The *Répertoire* also contains other information which makes it very useful to shipowners. Bureau Veritas also publishes monthly lists of maritime casualties throughout the world.

THE USE OF OIL IN GALES.

WITH the June North Atlantic Pilot Chart is published a paper of interesting reports as to the value of oil as a preventive to seas breaking on board ship. The paper is well worth consideration, because, whilst showing very plainly the great general efficacy of oil, it also shows that sometimes the effect may not be so great as expected, and that in some cases it is only partially beneficial; it also brings out other valuable points, viz., that oil may be of great use to a vessel running heavy—allowing her to steer better, and that if from any accident she broaches to, the oily wake will in all probability save her shipping a sea as she comes to. Its value, also, in leaving a vessel in boats is brought prominently forward in the case of the *Ottawa*, where the second officer states:—

"When we lowered away our last lifeboat, at the time of the wreck of the *Ottawa* on Blonde Rock, Nova Scotia, last November, there was a very heavy sea running. As the ship lay over on her beam ends it was very difficult to lower a boat, but by steadily pouring oil on the water to windward we were able to do so without any mishap. The oil knocked the heavy tops off the seas and prevented them from breaking."

Many reports are from steamers running in heavy gales in the North Atlantic; here the general consensus of opinion

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seems to be that the w.c.'s at the break of the forecastle are the best places down which to pour oil. In one case, the *Barrowmore*, a cask was lashed in the weather fore-rigging, with a tap and hose connected which extended to the water; this answered the same purpose as the former plan. The objection to bags slung over the side appears to be that they are often washed on board by the seas.

Sailing-vessels hove-to seem to find that the weather cathead is the best place from which to sling an oil-bag, the object in this case being to ensure the oil drifting into the vessel's wake, which, in such times, is usually abeam or before the beam. The remarks of Captain Rodhe, of the *Archdale*, evidently a careful and intelligent observer, are worth inserting *verbatim*. They are as follows:—

"I have used oil on several occasions in storms and hurricanes, and I find that it keeps the waves from topping, but does not stop a long sea from coming on board, especially in a heavy-laden ship. It keeps a breaker from coming on board, which is a very great advantage, and the long seas that do come on board are more like a flow over the rail, where the whole force seems to consist only in the actual weight of the water. The water never strikes with the same force as if no oil were used, wherefore I say that oil ought to be used, especially in a short chopping sea. For a long sea or swell, when the sea does not break or tumble over, I think the oil is of little advantage; at the same time I would use it in case a tumble should come along. And I should certainly never put a boat out in bad weather without having thrown plenty of oil on the water, and also supplied the boat with an oil-bag filled up. When running before the wind, especially if a ship is running for its life, if I may say so, I should put out, in addition to the oil, a long bight of a good-sized rope, making one end fast on either quarter and giving it if possible fully 90 fathoms, the longer the better, brace my yards on the wind and keep the wind nearly aft, or a point or one and a-half points on the quarter (especially to run out of the way of a hurricane), just enough to keep the lower top-sail full, and you would be surprised to see how beautifully the ship steers. Even those that would easily broach to steer splendidly, and I believe that a vessel is safer that way than hove to."

His remarks on running before the wind are specially valuable, and well worth the attention of sailing-ship masters. Another shipmaster, Captain Hodgdon, of the American barque *H. B. Hussey*, has also found that towing a line astern serves to break the force of the sea, and keep it from breaking over the stern.

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As an example of the use of oil in a sudden accident the case of the s.s. *Fonar* is a good one. Here the first officer reports as follows:—

"March 13th, in about lat. 44° 35′ N., long. 41° 30′ W., bound from Philadelphia to London, our port steering-chain carried away, and for a few minutes the ship came up in the wind, until the hand gear was connected. During the night oil had been used on both sides to ease the ship in a very high sea; owing to this, when we broached to, the sea broke long before it reached the ship, and we lay in the trough of a very high sea in perfect safety."

Had not oil been used whilst running, this vessel, in broaching to, might quite likely have shipped a dangerous sea, which, by this means, was avoided.

In one or two reports oil seems to have failed. Captain Jorgensen, of the s.s. *Olaf*, reports that in running before a westerly gale an oil-bag was rigged out about 15 ft. on a spar over the weather bow, but "the steamer's speed was too great to allow the oil to spread, and no appreciable effect followed." Capt. Lynam, of the American schooner *Geo. V. Jordan*, also says of a gale off the Cape, where he had three oil-bags out:—"The force or velocity of the sea appeared to overcome the effect of the oil to a much greater extent than I ever saw it do before." But the reports in general undoubtedly bear witness to the great efficacy of oil in heavy seas.

A report from Capt. Murdock, of the ship *Sierra Lucena*, may, from the warning it gives, suitably bring these remarks to a close:—

"Have found the use of oil in heavy seas of very great benefit. On one occasion, when in a cyclonic gale off the Cape of Good Hope, with the lower main top-sail blown clear out of the bolt ropes and the ship lying on her beam ends with the water above the lee dead-eyes, used oil with perfect success. *Two other vessels which we spoke the day before this gale were never heard of afterwards.** We use half colza and half raw linseed oil, and allow the bags to float, way out, with long lanyards."

W.

* The italics are ours.

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SEA-GOING MERCANTILE MARINE TRAINING-SHIPS.

THERE cannot be any reasonable doubt that special training and instruction not only tends to fit partakers thereof for prominent positions in the front rank of life's battle, but also ensures to them a greater share of unalloyed happiness. Ruskin has well said that "Few of us know what fairy palaces we may build of beautiful thought, proof against all adversity. Bright fancies, satisfied memories, noble histories, faithful sayings, treasure-houses of precious and restful thoughts which care cannot disturb, nor pain make gloomy, nor poverty take away from us, houses built without hands for our souls to live in." Knowledge may perchance be regarded by the neophyte from his lowly plane, as a tiresome means to a somewhat remote end; but, not infrequently, it contracts in some minds an independent charm, so that, eventually, peculiarly pleasing associations cause it to be cultivated assiduously for its own sake. The highest educational authorities are agreed among themselves that a well-balanced combination of theory and practice is most desirable for the better training of artisans and others in shore employments lest our trade pass into the eagerly-outstretched hands of strangers. Hence it is that technical training is fostered, and the results are so uniformly valuable that they may neither be minimised nor ignored, except by those whose eyes are perversely blinded. Education in its highest sense assists in raising the moral and intellectual condition of a man, so that he may not only be a good workman but also a good citizen. A sailing-ship remote from the land on the trackless ocean is indisputably the only proper school for a mariner; but it is undesirable that a youthful deck-officer should be merely proficient in seamanship, inasmuch as this would make but a machine of him, and would not extend his mental vision. The circle of requisite information for officers in the many and various ships of our vast Mercantile Marine is not fashioned from iron, but rather from india rubber, and its radius is ever increasing in length. Thoughtful deck-officers are aware that an intimate acquaintance with the elements of pure and applied mathematics is becoming every-day more indispensable; while, at the same time, to express

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their thoughts clearly on paper is not less essential to success. An exclusively nautical training is a decided mistake, for ideas act not as solitary units, but in combined groups, and all things that come within the proper province of the same faculty of the mind intertwine with and mutually support each other. Many years ago, when the education of naval officers was in a similarly sorry plight, there were to be found those who decidedly preferred hard fighting to hard spelling. It is related of a gallant admiral that, after winning a stoutly contested sea-fight, he remarked to a friend, who was congratulating him upon his victory: "It's all very fine, but the worst is yet to come. I have to write a report to the Admiralty." Doubtless, in some instances, the modern master of a carrying craft can appreciate the position at its full value. One of America's most illustrious sons, the late J. R. Lowell, sang in melodious numbers:—

> "Life is a leaf of paper white,
> Whereon each one of us may write
> His word or two—then comes the night."

Unfortunately for the deck-officer, the shades of night frequently fall and find him with a blank sheet, except in so far as toil endured and dangers overpassed are concerned. As a matter of fact, the responsible duties and sterling qualities of the large majority of our Mercantile Marine officers are but little known to the general public, as evidenced by the writings of land-bred novelists and the intemperate statements of clerks, whom chance has brought within barely measurable distance of seafarers. Mayne Reid knew far less about seamen than savages, yet he did not hesitate to mislead his readers, although perhaps unintentionally. In one of his books, entitled "The Flag of Distress," he introduces a British man-of-war sailor seeking a mate's post on board a merchantman. Her master said: "You can keep a log-book, I suppose," and the tough tar, after probably turning over his quid and hitching up his bell-bottomed unmentionables in the accepted drama fashion, grandiloquently replied: "I dare say I can. I've larned to write, so'st might be read, though my fist ain't much to be bragged about;" and asked to candidly state if he felt quite competent to undertake a mate's arduous duties, said deprecatingly: "Well, capten, tain't for me to talk big o' myself. But I've been over thirty years 'board a British man-o'-war—more'n one o' 'em—an' if I wan't able to go mate in a merchantman, I ought to be condemned to be cook's

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scullion for the rest o' my days." Somewhat similarly Edmund Yates, in his "Impending Sword," has gone out of his depth in affording a detailed description of a British Mercantile Marine officer rambling about the streets of New York. "A tall, thin man, with a hard, round, glazed hat pressed down over a mass of tangled hair, and with a thick full beard. He was dressed in a rough, short pea-jacket, with huge horn buttons, and coarse blue serge trousers, and looked like the second or third mate of an English collier." Such absurd word-paintings of the dress, deportment, and duties of our Mercantile Marine officers must be delightfully funny to seafarers; but unhappily they are received in all seriousness by too-confiding dwellers on shore. Stray scraps of pretended information in novels are paid attention to, and readers remember just what they ought to forget.

About a century has elapsed since a system of technical education was ably advocated by Adam Smith, whose work on "The Wealth of Nations" did much to dispel the intellectual haze that concealed the elementary principles of political economy from the public gaze. That renowned philosopher declared, with no uncertain sound, that the State would do well to encourage the teaching of elementary and geometrical drawing by awarding prizes to persons found proficient therein by means of suitable examinations, provided that the prize winners were dependent upon manual labour for a livelihood. Nevertheless his advanced views were not generally received as sound, and within the past fifteen years the late Sir Henry Cole, C.B., of South Kensington Museum fame, in the course of his evidence before a Royal Commission, asserted that within his recollection a Board of Trade minute was nearly passed which set forth in unequivocal terms that it was not any part of the business of the State to help carpenters to draw at all. Times are changed and we with them, for to-day many a Board School, many a Grammar School, has a work-room fitted up with the most modern appliances, within whose four walls the older boys are taught to handle a carpenter's tools with some degree of precision. When of more mature years they proceed to the workshop, to the mart, or to the counting-house, then the excellent evening classes subsidized by our Science and Art Department are invitingly at their very doors, at a merely nominal cost for tuition; and Whitworth's unparalleled munificence has tended to render all things possible to those mechanics who know how "to take occasion

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by the hand." The sea apprentice has so far been almost utterly neglected, and the result is most unsatisfactory, if not actually a national disgrace. He goes to sea at a tender age, when neither the curious charm, nor the possible money value, of learning has fired his soul; and is immediately thrown upon his own slender resources. Too much energy is often wastefully expended in holystoning decks and polishing brass-work in his earlier years which would be more profitably devoted to mental training, and it is not improbable that this want of a substantial foundation will be a most effectual hindrance to young officers desirous of sharing in the inestimable advantages afforded by such a Nautical College as that proposed to be opened at Liverpool. Let a youngster have a good grounding, in an ordinary English education at least, so that upon nearing manhood and enhanced responsibility, he may more readily realize that knowledge is power and learn something which is worth remembering. Navigation will be better understood by moderate, but continuous and well-directed exertions, than by any sudden spurt put on for the purpose of surmounting the Board of Trade barriers. The *Worcester* stationed in the Thames, and the *Conway* in the Mersey, are doing good work as training-ships for young officers of the Merchant Service, but the cost entailed upon parents must be prohibitive to many an ingenuous youth. Just two years ago, when addressing a meeting of gentlemen interested in the training of officers for the Mercantile Marine, Lord Brassey is reported to have said: "I opine that all of those present will assent to the proposition that England is the first of all maritime nations, and that, therefore, the first and most important of her interests are maritime in their character. If you wish those interests to develop, it is of pre-eminent importance that the officers, who are to command the ships, shall be efficiently and satisfactorily trained." Two splendid sailing-ships, well known in the Australian trade, the *Hesperus* and the *Harbinger*, were fitted up as sea-going training-ships, carrying 24 cadets each, together with the necessary officers and instructors. The expense was great, and it is a question whether this scheme of Lord Brassey has been attended with results of much practical value. Sir W. B. Forwood, distributing the Science and Art prizes at Liverpool, in the course of an exceedingly interesting address on technical education, as reported in the *Journal of Commerce* of that city, said that: "An artisan in any mechanical trade

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could almost double the value of his labour if he had a sound theoretical knowledge. It was to him a matter of deep regret that so little attention had been paid to the subject of navigation. It was a disgrace to the country, and especially to a great maritime nation like England, that navigation should be so imperfectly taught." He might have added that the powerful cry for cheap labour by those shipowners who measure cheapness by the false standard of wages has helped to keep navigation in so deplorable a state. Shipmasters' Societies have requested the Board of Trade to make stiffer the examinations which must be passed by every man before he can become a deck-officer; that the Science and Art Department should devote special grants for the technical education of officers as it does to agriculturists at present; that a well-equipped navigation school or nautical college should be at the disposal of officers in each of our large seaports; and that training-vessels should be provided to ensure a short course of practical seamanship to youngsters studying at the proposed colleges. Shipmasters and officers are, by the very nature of their hazardous profession, isolated from the world and its ways; and not being sturdy beggars their wishes may remain unfulfilled till the Greek Kalends. Hence it behoves every one of them to become a member of one or other of the several Shipmasters and Officers' Societies, and unite in an earnest effort to obtain some of the good things of education so bounteously bestowed upon those whose lives are spent on dry land. Officers in large employs who hold aloof should remember the story of the bundle of sticks. Some of the County Councils are attempting to provide for the technical instruction of fishermen; and the action of the Northumberland County Council will, we sincerely trust, be attended with the success it deserves. Skippers and second hands of fishing craft have to pass elementary examinations for certificates of competency, and in order to provide proper instruction in the requisite subjects, this live County Council have, we understand, afforded facilities for a number of fishermen, drawn from Berwick, Holy Island, North Sunderland, Craster, Newbiggin, Blyth, Cullercoats, and North Shields, to pursue a three weeks' course of training at the well-known Marine School, South Shields, with the view of hereafter conducting classes in their own localities. The men selected for this important work each receive 35 shillings per week during the three weeks, in addition to their railway travelling

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expenses. Our heritage is the sea; but our youths look askance at a life where dangers and disabilities abound on every hand, where the rate of pay for deck-officers is abnormally low; and last, but not least, where the foreign element is fast becoming more and more pronounced. It yet remains to be seen what effect, if any, the righteous and temperate demands of the Shipmasters' Societies will have upon those who control the strings of the educational public purse. Shipmasters have been remiss in the past, not having fully grasped the infinitely great possibilities of combination; and it is high time that they aroused themselves and swept away this anomaly, which opens every educational avenue to the dwellers on shore at the expense of the State, but positively prevents our hardy toilers of the sea from participating in these advantages. In November, 1866, at a meeting of the Economy and Trade Department of the National Association for the Promotion of Social Science, in a paper read by Captain Henry Toynbee, F.R.A.S., he went fully into the hardships of seafarers in the Merchant Service, and concluded with valuable suggestions, some of which have become law. Others remain inoperative, but his suggestion "That the Government might check the decrease of British seamen by establishing training-ships for poor boys (especially sailor's sons), and, if it be found requisite, by encouraging shipowners to take apprentices," has been much accentuated by the lapse of a quarter of a century. Apprentices are becoming a vanishing quantity, inasmuch as shipowners are averse to the system, but demand the ready-made article; while, at the same time, fewer British boys evince a liking for the nautical profession. Steam has robbed the sea of its poetry, and there are very few ships afloat to-day which would serve as a source of inspiration for the following lines:—

> "She walks the waters like a thing of life,
> And seems to dare the elements to strife.
> Who would not brave the battle-fire, the wreck,
> To move the monarch of her peopled deck."

Plimsoll's mark spoils the modern ship's beauty by reason of its necessity in a very few cases; and the "peopled deck" is but a fiction among single-ship companies. Moreover, promotion is very slow, owing to the fact that shipmasters sit tight, even when incapacitated by age and increasing infirmities. We have known a man stone-deaf, and far from

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his meridian, who still held command of a large iron sailing-ship! The sea is not an old man's profession by any means; yet Captain Cook, of the *Etruria*, was 73 or 74 when his command terminated; and Captain Collier, who died last year at New York, aged 77, had only been four years retired. The latter master had rounded Cape Horn 54 times, and during his long service had only one mishap, and that was 40 years ago, when he lost the barque *Hobart* on the coast of South America. Other instances of extremely old shipmasters still turning the salt sea in furrows will readily recur to those that go down to the sea in ships.

A school for navigation has just been established at Mannheim, which is probably the first of its kind in any town of the Rhine provinces. The subjects to be taught are: shipbuilding, work on board ship, ocean and river navigation, geography, and the ordinary elements of a commercial education. The students will only be required to pay a nominal sum, as the Town Council has undertaken to make an annual grant in support of this useful institution. A French Parliamentary Committee have recommended to the Minister of Marine that a nautical school should be established as a feeder to their languishing Mercantile Marine. Young men would be required to undergo a year's preparatory course on board a vessel lent by the State for that purpose to accommodate one hundred pupils, who would have to pay for their food and clothing only. The second year's training is to be carried out on board a ship of the national fleet, where a course analogous to that of a Nautical College would be provided for them. At the close of this year's training sixty out of the hundred are to be chosen by examination, and placed for a third year in the Navy under the care of qualified instructors. Those who fail to obtain officers' certificates at the expiration of this period will be called upon to give two years' additional service. Here it will be seen that the tie between the State Navy of France and her Mercantile Marine is closer than in this country. A school at Marseilles, moved by the increasing scarcity of youngsters in French cargo-carrying craft making long voyages, has opened a branch, which it is hoped will prove to shipowners a nursery for youths of good education who have already received a certain amount of theoretical and practical nautical instruction, and destined to furnish a choice of officers worthy of the important duties that are often entrusted to

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them. This nautical branch was opened towards the close of last year; and, notwithstanding paucity of advertisement, no fewer than 25 scholars, ranging in age from 16 to 20 years, were admitted for a two years' course. They are taught the names of everything connected with a sailing-ship's hull, masts, yards, and rigging, and even the simple manœuvres, by means of massive models erected in the class-rooms. Practical work is supplied by boat exercise and an occasional short trip in a tender. It fairly follows that these youngsters will be more expert after this training, however imperfect, than they otherwise would; but, it must not be forgotten that picking up a topgallant-sail at sea in a snow-storm is a distinctly different operation from giving the same sail a snug furl on a summer's day in harbour, with a light breeze and a smooth sea. Shortening sail on board a merchantman would be confusion worse confounded to an officer of a war-ship, but merely madness with a method in it to his mercantile *confrère*. It is pointed out by the writer of an article in the French paper *La Nature*, to which we are indebted for this description, that formerly young men of good education were trained in French merchant ships to become officers thereof. The supply has fallen off in consequence of the fact that sailing-ships are fewer and that the big companies take Navy officers who leave the service of the State, where promotion is slow. These young men lived at the captain's table, profited by professional conversation, and kept watch with the officers. Now the deck-officers are recruited from the ranks of those who have been at sea for five years in inferior positions, little in keeping with those they will occupy after examination, and some of them destitute of the necessary elementary training. Education and nautical training should proceed *pari passu* at sea; but, not infrequently, the cart is put before the horse in this matter, for it is assumed that after four or five years' practical work a young man's neglected education can be rehabilitated under a crammer in a few weeks. The large French companies have agreed to take the young men from the Marseilles School, in possession of diplomas, as junior officers, and to complete their instruction. The necessary sea service for obtaining a certificate would be passed under the most favourable conditions, and their previous two years' technical training would prove very valuable. Stationary training-ships for young officers, such as our *Conway* and *Worcester*, have much of good n their methods; but depend upon it the actual

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experience upon the deep sea, in sunshine and in storm, obtained on board a sea-going training-ship, is of infinitely greater utility.

The United States authorities have boldly grappled with this subject in their earnest desire to encourage the formation of a large fleet of merchant ships worthy of their country's traditions, and with officers and men who are American citizens. New York and Philadelphia each have a sea-going training-ship, lent by the Navy Department, for the purpose of training American youths for the Merchant Service. The Secretary of the United States Navy has power under an Act of Congress to lend to local bodies at each of the five ports of New York, Boston, Philadelphia, Baltimore, and San Francisco, a suitable ship with all her gear, charts, books, and instruments of navigation, and detail naval officers as superintendents and instructors, on the understanding that when no longer required the ship shall be returned, and that she shall not be used for reformatory purposes. The New York school-ship *St. Mary's* is a roomy old-fashioned corvette of 1,025 tons displacement, and while at Southampton last month, on her annual cruise, we remained on board of her for two days, at the invitation of Captain John McGowan, U.S.N., her commander. We were charmed with the extreme cleanliness of the old ship herself, and the 78 youngsters in training, many of whom were on their maiden voyage. Practice and theory are combined in due proportions in the tuition afforded, and after two years on board such a ship, provided a youth receive the school diploma of graduateship, he ought to be permitted to receive a junior officer's certificate without further inquiry. The *St. Mary's* goes from Southampton to Cherbourg, Lisbon, Gibraltar, Tangiers, and Madeira, returning to New York about the middle of October. Leaving home again in January, she will proceed for a winter cruise to the West Indies, returning in April to prepare for her annual trans-Atlantic trip. Candidates for admission in these sea-going training-ships must be between the ages of 16 and 20 years, of average size, and pass a strict medical examination, must produce several testimonials of good character, have an inclination for a life on the ocean wave, and enter of their own free will, and be able to pass creditably an entrance educational examination in spelling, reading, writing, and arithmetic. Boys admitted to the *St. Mary's* are only called upon to provide a moderate outfit and to deposit thirty dollars to defray the expense of

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white and blue uniforms during the whole term on board. Should a boy be withdrawn, expelled, or desert, his deposit is forfeited to the ship. We gathered that this deposit will not be demanded in future, for occasionally parents find a difficulty in furnishing the requisite amount, and thus a boy who would make a good sailor is prevented from enjoying the inestimable advantages afforded to those who have the good fortune to serve two years in one of these sea-going training-ships. The expense of maintaining the *St. Mary's* is about £5,000 per annum, and she could comfortably carry 100 scholars, together with the necessary officers, petty officers, and seamen. In May, 1891, but 70 boys left New York in her for that year's cruise, and of these only 19 would appear to have graduated. Nevertheless, it would be quite unfair to assume that the amount of good work done can be measured by a money standard. Not every youngster trained on board the *Worcester* or the *Conway* goes to sea, but the discipline to which all have been subject, and the education received, tend to fit them for shore employment also, and implant a sympathy for the Mercantile Marine. Hence, the public good has not suffered so much as might appear at a cursory glance. It is a matter for regret that more of the youths trained in the *St. Mary's* do not eventually adopt the nautical profession, but the commonwealth will find that those who elect to remain on shore will be all the better citizens for their technical training. Corporal punishment is unknown on board of her, but a disobedient boy soon finds that after careful inquiry he is deprived of a run on shore at the next port, and this soon brings him to his senses. Some of the boys were in London on a holiday, and in many cases the parents deposit with Captain McGowan a sufficient sum to provide pocket-money for their boys in each of the ports touched at on the cruise. The *St. Mary's* is rather old, and for the past 17 years has been continuously engaged as a training-ship. Her lower-deck requires renewing and lockers built all round it to contain the boys' clothing. At present bags are in use, but they are unsightly, and must be very awkward to the youngsters. She is fitted with old-fashioned single top-sails, than which no rig could be more behind the age. They should be at once replaced by double top-sails in agreement with modern practice, for single top-sails may be positively dangerous to such a ship in a sudden squall at night time. An Act of Congress requires that all the officers and a certain percentage of the crews of steamers

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carrying the U.S. mails shall be citizens of the United States, and this will enable graduates from these sea-going training-ships to obtain positions more readily. The Pacific Mail Steamship Company have notified Captain McGowan that any graduate of the *St. Mary's* can obtain employment on the steamers of that line; to receive 240 dollars the first year, 300 dollars the second, and afterwards they will be regularly promoted through the grades of deck-officer. The boys looked very happy, the food was of the best quality, and every officer on board seemed to take a proper interest in their young charges, both as regards the duties of a seaman and of a navigator. In the number of this Magazine for September, 1890, we drew special attention to the training of boys on board the United States corvette *Saratoga*, a sister ship of the *St. Mary's*. We spent a short holiday on board of her, then off Netley; and, not long since, on visiting her at Philadelphia, we were glad to learn from her commander, Captain F. M. Green, U.S.N., that no fewer than 51 of his boys in blue graduated last December after two years' training. During that period they had been instructed in Arithmetic, Geography, Navigation, Nautical Astronomy, and Seamanship, and had the unlimited use of an excellent library. Geography as taught in shore schools is often a most uninviting subject, but the officers of the *Saratoga* make it worth attention. Interesting map questions, especially relating to the coasts and islands of the world, alternate with instruction in Physical Geography, more especially relating to winds, currents, general meteorology, and magnetism of the earth. In Navigation they were taught to lay down courses and distances on a chart, to plot positions after obtaining them by dead reckoning or observation, to calculate currents and steer courses to counteract them, to find the course and distance between two places, to correct courses for variation and deviation, and to plot and use a great circle track on a Mercator's chart. In Nautical Astronomy they were thoroughly taught to find latitude by meridian altitude of sun, planet, or star, by Polaris, and ex-meridian altitude of the sun; to find the longitude by time sight of sun, moon, or star; to work out and use Sumner's lines; to find chronometer error and rate by artificial horizon sights on shore or by the sea horizon in port; to find azimuth or amplitude from observations of the sun; to make a deviation table from bearings of sun or of terrestrial object; to make and use a Napier's

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diagram; and to find the moon's meridian passage and time of high water. In Seamanship the boys were taught a seaman's duties in every particular as far as time would allow. During the three cruises they were taught to steer; to heave the lead; to make and shorten sail; to work ship; to send up and down the upper spars and yards; to splice and knot; to use a palm and needle, marline spike, and serving mallet; to wash their own clothes; to clean the ship; to row and sail boats; and to swim. They have also been thoroughly instructed in the laws for preventing collisions and in the Rule of the Road at Sea. Youths on board the *St. Mary's* go through a similar course of training.

Many a practical navigator will agree with us that there is a royal road to nautical knowledge opened out by two years' service on board a *Saratoga*, or a *St. Mary's;* a *Harbinger*, or a *Hesperus;* although the latter, of Lord Brassey's inauguration, are too costly for people of moderate means. Youths who leave the land to brave the dangers of the stormy sea have a well-grounded cause of complaint against our educationalists, inasmuch as not one farthing of the public money allotted to technical training is devoted to ensuring its advantages to seafarers. Agriculture, for example, is of secondary importance when compared with navigation; yet the former partakes of the educational grant, but the latter does not. Without our carrying craft we should find it difficult to exist in this country for a fortnight, whereas our agriculturists would scarcely be missed. It behoves our Shipmasters' Societies to bring this neglect of the British Mercantile Marine before the bar of public opinion, and the verdict must surely be in favour of educational extension to their clients. Let a national system of sea-going training-ships for officers of the Merchant Service be introduced, and it is not improbable that by this means our ocean-carrying craft will in the near future be officered by British-born men, well versed in the theory and practice of their noble profession, and able to hold their own against all comers ashore or afloat. Royal Naval Reserve officers, who have served in a war-ship, should be specially suitable for the conduct of this important work, being familiar with naval discipline, and in hearty sympathy with the attempt to better the condition of the Merchant Service to which they belong.

WILLIAM ALLINGHAM.

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PARLIAMENTARY REPRESENTATION FOR THE MERCHANT SERVICE.

(COMMUNICATED.)

MEETINGS of Corporations representing the shipping interest held during the past month seem to show the great need of Parliamentary representation which shipowners can *depend* upon to watch their interests; and, indeed, now that J. H. Wilson, of Seamen and Firemen's Union notoriety, has managed, after several tries, to gain a seat, it would seem absolutely necessary that shipowners should have a representative of their own. It may be said that there are many shipowners in Parliament. This is true, but they do not sit *for* shipowners, and are too ready to truckle to the labour vote to be reliable. This has lately been pretty plainly shown by the passing of the latest Bill affecting Merchant Shipping which, brought in by a private member, who knows less about shipping matters than Mr. Plimsoll—and that is saying a good deal—was taken up by the Government and passed with scarcely any opposition worth the name; and now that it is passed it will probably benefit no one. The seaman for whose benefit it is intended will probably be a loser by it. He has, in days gone by, been known to growl at being kept too rigidly to his "pound and pint," the likelihood now is that he will be still more strictly kept to it, getting nothing but what the shipowner is, under inspection, *obliged* to give him. But to pass on. The new illiterate voter, carried to and fro by every windy orator, will make his voice heard through his "labour" representatives, and amongst others the seaman will not be forgotten. Now, as during the "union" agitation, we impressed on our readers that in real truth the officers' interests were akin to those of the shipowners, so now we say again. The Shipmasters' and Officers' Societies are, united, strong enough to compel legislation on their behalf. In doing so they should, so far as possible, endeavour to keep within bounds, and shun any drastic overreaching measure which would excite hostility amongst their employers. At the General Shipowners' Meeting, Mr. Bromage drew attention—and we think rightly—to a piece of threatened legislature, which, in our opinion, goes too far, namely that—in his own words—"There was hanging over their heads a

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Bill, sure to be brought forward from last session, which would allow none but a certificated engineer to work even a donkey boiler, on shore or afloat." Such far-reaching schemes as this are liable to over-reach themselves, and in the end stop indefinitely what might have been made useful and reasonable legislation. But passing from ship-*owners*, does it not appear to be time that ship-*masters* and officers had a Member in the House, one of their own profession, to represent them, and see that in these Merchant Shipping Acts, which follow each other in a yearly string, their own peculiar interests are not forgotten or overlooked? The Board of Trade* are rather too ready to look on the certificated officers of the Merchant Service as a class of men under their orders and in their charge—as a class which they are to be "down upon" when opportunity offers. But the department, rightly considered, has a higher vocation—that of *caring* for and watching over the interests of this class. It is, however, to be feared that in their extreme anxiety for the safety of the seaman the officer is too often overlooked. There are matters in this direction which call for attention, and we think Shipmasters' Societies might agitate to be allowed to vote by proxy when away from home, and to have a member of their own to see that justice is done them. Mr. J. H. Wilson, now that he has got to the House, will have to do something for his money, for he is purely a paid representative of a class. The interests he represents, he is always careful to show, are antagonistic to the masters and officers. Surely, then, it is time to be up and doing. We have many good seamen, well up in their profession, and possessing in addition a good education, any one of whom would be a credit to the House of Commons, could we but get him there, and who would command the confidence of the seafaring community, which men like Messrs. Plimsoll, Howell, and others of like kind, can never do. He would also be able at once to put his finger upon the blot in any measure affecting shipping that might be brought forward by a faddist. Moreover, he would naturally find a place on any Committee appointed to consider nautical affairs, which would gain public confidence by his presence. The matter is one worth consideration, and the present time of instability in Parliamentary things is possibly, for some reasons, a good one

* We have lately been told that there is no Board of Trade,—but the Merchant Shipping Act, 1854, pretty clearly defines the Board and its powers. It is waste of time splitting hairs in this direction.

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to start the idea which we commend to the attention of the Federated Shipmasters' and Officers' Societies. If no other means are available, a candidate might be chosen to stand for some constituency where there was a reasonable chance of success, and interest might be worked up to endeavour to ensure his gaining the seat. But with our numbers so scattered this is, perhaps, scarcely to be hoped for, and we think a more fair and just way would be to allow officers to give their votes by proxy and have a representative of their own. The seamen and firemen have now got *their* representative; the officers ought not to let the matter rest till they also are represented.

NAUTA.

CORRESPONDENCE.

CERTIFICATES IN THE MERCHANT SERVICE.

To the Editor of the "Nautical Magazine."

SIR,—The shipmasters and officers of the Merchant Service should hail with unmixed satisfaction the fact that in the next Session of Parliament the Shipmasters' and Officers' Federation intend to promote a Bill, which, if passed, will greatly improve their position. It is to be feared that Home Rule is likely to be a great hindrance to useful and necessary legislation, but still, if well backed, it should not be absolutely impossible to pass the proposed Bill, which, on the face of it, does not appear likely to raise any storm of opposition, aiming, as it does, to remove very manifest injustices.

But it behoves the promoters to be careful not to overshoot the mark; in the text of the proposed Bill, as it stands, this would almost seem to have been done. If *too much* is aimed at the fear is that the measure may be wrecked by injudicious proposals. The clauses we particularly refer to are the following:—

1. "No home-trade ship exceeding 50 tons burden shall go to sea . . . . unless, at least, the master possesses a certificate."

2. "No certificate of competency or service as master, mate, or engineer shall be issued to any person other than a British subject."

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With the other clauses as they now stand we see no fault to find. Let us consider the two mentioned.

The Load-Line Act exempts vessels from marking if under 80 tons and employed solely in the coasting trade, or ships employed solely in fishing, and pleasure yachts. Might not such exemption be reasonably applied to certificates? Fishermen are already looked after in this respect; we would say, let the Bill leave them as they are at present; and for ordinary coasters let a similar limit to the Load-Line Act exempt them. The clause as it stands would bear very hardly on a large fleet of coasters, which make short trips; such, for instance, as the limits of the Bristol Channel or the Forth. It seems scarcely necessary to oblige skippers of these small fry, who never lose sight of land, to give up their employment (for there are dozens of them who could not pass the ordinary master's examination) who, though no scholars, are thorough seamen, and could show the way (in their own peculiar branch of seamanship) to the best foreign-going extra-master who ever trod a plank. Even if the change were made at all we are inclined to think that the Act ought not to be retrospective.

Then again, as to aliens, Is not the clause as it stands too sweeping? Would it not be more judicious, as entailing less trouble to shipowners, to amend the clause thus:

"No certificate of competency or service as master or as chief—or only—engineer, shall be issued to any person other than a British subject?" This, in a very short time, would have the same effect as the more sweeping proposal, and would cause less immediate friction after the passing of the Bill. For example, take the case of the firm of P. Denniston & Co., Glasgow, the principal of which has lately interested himself in the matter of improved cookery on board ship. This gentleman, if the clause were passed as printed, would have to find some forty-five British subjects as masters and mates for his fine fleet of vessels, whereas if the masters only were required he would only want about fourteen.

If the master were a British subject he would not be long content with foreigners as mates, and in a short time the disease would work its cure in a natural way.

It seems absolutely necessary that some legislation should take place to remedy the present anomaly, seeing that now even those fine steamers which are on the Admiralty list as cruisers, and so on, may be commanded by men of any

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nationality. Surely in case of war this would have to be altered. Then why not prepare the way in time of peace?

Whilst on the subject of the master's certificate, it might be worth consideration, especially in view of the present craze for higher qualifications, whether a clause could not be inserted to provide that vessels carrying Government passengers and troops, and those which are on the "cruiser" list, should be commanded by extra-masters or Naval Reserve men. Unless the higher positions in the Merchant Service can only be held by men who have proved their higher education, the present movement to that end can only end in smoke; and yet even if this matter were legislated for, we doubt the wisdom of it after all. But, certainly, as no one but a British subject can belong to the Army or Royal Navy, surely it is a necessity that "cruisers," at least, should also be in charge of a British subject. We think if the Bill is placed in good hands it must pass. At the same time it would be a pity if it were left to gentlemen like Mr. Plimsoll, who, though well meaning enough, makes many mistakes through ignorance of his subject, or to men like J. H. Wilson, of Seamen's Union notoriety, who, instead of supporting such a Bill, might be disposed to hurry it to destruction.

Yours faithfully, W.

TRANSPORT OF PETROLEUM THROUGH THE SUEZ CANAL.

To the Editor of the "Nautical Magazine."

SIR,—If the article in your June number by G. H. Little is intended to show that the carriage of petroleum in bulk is not more dangerous than the carriage of oil in cases, then certainly some of the illustrations by which he seeks to impress his views on persons of ordinary intelligence are not very convincing; for no practical man will admit that there can be any analogy between cotton, dynamite, or gunpowder, as at present packed for sea carriage, and petroleum in the proposed tank steamers.

A fair illustration to show the difference in risk would be to contrast oil in cases with oil in tankers, and gunpowder in kegs with gunpowder in bulk, but there is just this in favour of the latter, that in the event of fire the vessel might possibly be scuttled in time to avert a catastrophe; or if cut through by collision the bulk powder would either run out into the canal water and become harmless, or else the canal

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water would rush into the powder hold with the same effect. Even the case-oil steamers may be scuttled so as to *reduce* the risk, but the tanker cannot be submerged without *increasing* the danger in the canal, or other narrow waters, as the oil must float to the surface, and the *Wildflower* case shows what result may be expected.

Then is it fair of Mr. Little to suggest that "Shipowners engaged in the bulk trade have never shown, as the *Tankerville*, *Wildflower*, and *Lux* disasters testify, that they regarded the trade as specially dangerous?" The answer is plain, the disciples of modern science did not point out the danger *before* those disasters occurred, which taught the shipowners how dangerous the trade is; but how do these cases advance the argument? It is not the owners of the tankers who protest but the owners of other vessels using the Canal, who see that the Suez Company's regulations are not sufficient for safety; and whether the French Government have approved of these regulations or not, they certainly will have to be altered if the safety of passengers through the Canal is to be secured.

Another curious mistake is made by Mr. Little when he says that "the burning oil floating on the water, on reaching the sandy banks, would be absorbed, and the fire quenched." Now most people who have passed through this waterway will be well aware that where the sides are not protected by stone work, or gabions, the sand is soaked for two or three feet above the water level by the wave that follows each vessel, and the oil could not be absorbed. Therefore his suggestion that "the Suez Canal would be a more proper scene for a fire than, say New York," fails utterly, like many other purely scientific theories when put to a practical test. The risk is the same in both cases.

The greatest danger for the Canal traffic will be collision with a tanker in which the shell plates might be cut through and several hundred tons of oil let out on to the water, perhaps into the stokehold as well; and if this took place on the Lake of Ismailia, the whole surface might be covered with blazing oil, destroying life in all the vessels passing through, and probably in the town as well, for if the wind blew in that direction, certainly another plague of Egypt would be added to the list.

Yours, &c.,

London, 23rd June, 1892. G. A. L.

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DECK-LOADS AND COURSES NOT MADE GOOD.

To the Editor of the "Nautical Magazine."

SIR,—On page 154 in your February number, "W." unjustly blames deck-loads for the stranding of steamers in the Baltic. Why does not "W." show his wrath in the right direction by letting masters know that unless they ascertain the heeling error, and correct it, or allow for the same, they are morally to blame for their steamers going on the rocks (if there is a blame), and not the deck-loads.

Some very strange strandings occur in the Baltic, especially of British steamers; and it is not always that the real cause of disaster comes to light at a Court of Inquiry, and to blame the deck-loads for the mischief is not right.

Let us try to be just in all matters, with deck-loads as well as with shipmasters.

In a sailing-vessel, I quite agree with "W." that a deck-load is a nuisance, lumbering the deck, and making the vessel less stable than is safe, especially if she is of fine lines; but in the modern tramp a moderate deck-load is a comfort to all on board, the vessel being more easy in a high sea, and decidedly much drier.

I have carried deck-loads for twenty years, and never lost a stick with a full deck-load, the weight of the cargo keeping it down, and leaving no room for water on deck.

On the other hand, I have found the three feet deck-load dangerous; when the sea breaks on board it lifts the cargo, and with the motion of the vessel it works loose and goes overboard, if it does not do greater damage before doing so.

The vessel W. mentions in page 157 was probably lost through her three feet deck-load breaking loose in this manner, but if that deck-load had been stowed level with the rails, leaving no room for water on deck, it is just as probable that she would not have been lost.

As for stability, there is ten to one lost through having the centre of the cargo too low, against the one having it too high. I only know of one or two steamers having capsized loaded with wood.

Every shipmaster must know and bear in mind that he alone is responsible for the safe conduct of his vessel and cargo, and if she heels over he must still know the course she makes good; and if he does not, and she goes on the rocks, he is to blame, and not the deck-cargo. What is the master of an iron sailing-ship to do when a fresh breeze heels her over

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10 to 15°? If he runs her on the rocks, W. might as well blame the wind for stranding her as the deck-loads.

Why does not England teach her shipmasters how to compensate the compasses for heeling and other errors, and make them do it, instead of sending "penny shopkeepers from round the corner" to perform this most important duty of the master? Who is in the best position to perform this work, the master that sails the ship and has an opportunity to watch all the whims and irregularities of the compass, or the other man?

Why not let them know that they carry with them such important passengers as the "Centre of Gravity" and the "Centre of Volume," the laws of weight and powers, etc.

Perhaps such questions possibly have something to do with excessive timber deck-loads and a few of the strandings that W. so conveniently blames the deck-loads for.

Yours obediently, ANOTHER W.

(Admiral Colomb's letter has reached us too late for publication this month.)

BOOKS RECEIVED.

North Atlantic Pilot Chart. Hydrographic Office, Washington, U.S.A.

THE July number of this much sought-after series is specially interesting to practical navigators. Every prominent feature of previous charts has received due attention in order that trans-Atlantic navigation may have its risk reduced to a minimum. A cyclone developed over the lower end of the Florida Peninsula on the 10th ultimo, and a glance at the chart shows that it first moved north-east, but soon recovered to the southward, made a curious loop in its track, and then proceeded north-east again. The typical example of a cyclone of small diameter and great energy, which is given in the upper left-hand corner of the chart, should be compared with the accompanying reports of several ships that passed through it. Too often theorists ignore the fact that the navigator has to foretell coming weather without the aid of observations other than his own, and, to enable this to be done, would appear to be one of the most pressing problems of ocean meteorology. The supplement, containing a graphic record

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and a complete list of all May and June reports of North Atlantic ice, will be both interesting and useful to navigators. No fewer than 250 reports of ice are given, the maximum number on any one day being 13. During the four days 8th-12th May, from 48° N. 46° W. to 46° N. 48° W., the *Kommandor Svend Foyn* passed 43 bergs. On 14th-15th May hundreds of bergs of all sizes were passed by the *Ulunda*, of which the first was about 220 miles east of St. John's. Just one month later a berg was seen aground about half-a-mile off the entrance to that harbour. The German steamer *Hafis* passed an enormous berg, 600 feet high and 4 miles long, on 17th May in 46° N. 47° W. Even this mass is surpassed by an ice island in the South Atlantic, which is a drifting menace to navigation as we write. Captain A. G. Froud, R.N.R., the Secretary of the London Shipmasters' Society, received a well-written report from Captain E. H. Andrews, of the iron sailing-ship *Cromdale*, that on the 6th April, when in 46° S. 36° W., she just cleared an iceberg 1,000 feet high, while the horizon to windward was a complete mass of towering icebergs. One thousand feet is an exceptional height, but is undoubtedly a reliable eye measurement of Captain Andrews, for 12 days later the iron barque *Strathdon*, in 45° S. 25° W., found herself surrounded with immense icebergs, one of which Captain A. T. Wells, her commander, reports was quite 1,000 feet high, thus confirming Captain Andrews in his estimate. Captain Wells has received a testimonial from the whole of his crew, setting forth the sterling seamanship displayed by him on that occasion. Several other ships have reported this awful assemblage of huge icebergs; and one, the *Duntrune*, was seriously damaged by collision therewith, so that it behoves navigators to be on their guard.

Report of the Chief of the Weather Bureau for 1891. By Mark W. Harrington. From the Report of the Secretary of the United States Department of Agriculture for 1891. Washington. 1892.

THIS is the first detailed report which has been issued by the Weather Bureau since it was transferred from the Signal Service to the Department of Agriculture. It deals only with the last half of 1891, the transfer of the work only having been completed on July 1st. The report deals more especially with the practical work which is done, and gives in detail

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some of the features of especial interest to the public. The first care, on the transfer, was to improve the forecasts and their distribution in every possible way. The time covered by the forecasts has been lengthened to 36 hours, and the forecasters have been encouraged to make their predictions still longer whenever they see a fair prospect of verification. At the same time the forecasters have been instructed to put their predictions in language, which will be easily understood by everybody. The success of the verifications has increased during the half year to 86 per cent., whereas in 1890 it was only 83 per cent. Before the transfer to the Agricultural Department forecasts were issued to 630 signal display stations, but at the end of 1891 the signals were displayed at about 1,650 stations. The ordinary system of signalling by flags has been extended, and a similar system has also been greatly in use on the principal railroads throughout the country, the symbols, made of tin or sheet iron, being displayed from the baggage cars. A system of steam-whistle signals is also in use at a number of stations, by means of which the weather conditions are communicated in places where flags cannot be seen at long distances, those within range of the sound of the whistle being supplied with the code which is used at stated hours to communicate the probable weather conditions for the coming 24 hours. This whistle code is intended for use at stationary engines, and is not applicable to the railway. The report mentions that a warning of a killing post for the cranberry district of Winconsin, on August 24th, resulted in the saving of over one-third of the cranberry crop in that State, representing over 125,000 dollars. Information as to the weather is now gathered from an extent of more than 3,500,000 square miles of the earth's surface, on the American continent, which is about one-fortieth part of the whole surface of the globe. With so large a network of observatories, and with a proportionately large income at their disposal, it is no matter for surprise that the results achieved in America are of a higher order than those in our own country.

Estrategia Naval con Algunas Consideraciones sobre Organización, Movilización y Composición de la Escuadras. Por Don Manuel Montero y Rapallo. Madrid: Alvarez. 1892.

THIS essay on naval organization and naval strategy comes at a time when those subjects are attracting much attention.

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By the approaching completion of the large additions to the fleet provided for by the Naval Defence Act, we have now a large fleet of ships of all classes up to the latest improvements, and the question arises how best to use them in the event of war. This has been the subject of much discussion in England, and Don Montero has, in the work before us, gone very fully into the whole question in a work of over 500 closely-printed pages. Preparation, mobilisation, and concentration, both as regards war with an important enemy and minor operations, offensive and defensive tactics, and the use of mercantile auxiliaries, are all treated fully.

Elektrotechniser Unterricht und Anleitung zum Betriebe Elektrischer Anlagen Nisbesondere auf Kriegsschiffen. Von M. Burstyn. Pola. 1892.

HERR BURSTYN is a chief engineer in the Austrian Imperial Navy, and the work before us is a text-book for naval officers and engineers on the use of electricity in ships, especially ships of war. The subjects of magnetism and electricity are very fully treated, both theoretically and practically, with especial reference to electric lighting and signalling at sea. The work is done in that thorough manner which we are accustomed to find in German technical works, and the illustrations, of which there are over two hundred, are especially good, the details being shown with great clearness. The work is fully up to most recent developments of the subject.

The Liverpool Journal of Commerce Shipowners and Captains' Blue Pigeon. By G. H. Little, Asso. M.I.N.A., Master Mariner.

THIS unpretentious little volume contains nearly 150 pages of information with respect to shipping matters, which should be very useful to owners, masters, and officers of merchant ships in general. Its compiler has evidently kept well in view the advice of genial old Captain Cuttle, "when found make a note of," and every page bristles with important items of doubly distilled nautical knowledge. A copy should be on board every ship, and in every owner's office, to afford the means of enquiring within when in doubt on any matter concerning the nautical profession, ships, and cargoes. We agree with Captain Little that "it will justify its publication," and hope that "it will induce those interested to think and study."

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THE ROYAL NAVAL RESERVE.

The Gazettes.

Admiralty, June 30th.

Sub-Lieutenant W. N. McGachen to be Lieutenant (to date June 30th 1892).

Admiralty, July 1st.

Sub-Lieutenant A. C. Turner to be Lieutenant (to date June 30th, 1892).

Admiralty, July 5th.

Commander G. H. Rainier (lately commanding R.N.R. drill-ship *Eagle* at Liverpool) has this day been placed on the retired list at his own request, with permission to assume the rank of Captain.

Admiralty, July 6th.

Engineer A. Macleod to be Senior Engineer (to date July 4th, 1892).

Admiralty, July 7th.

Sub-Lieutenant E. J. Laming to be Lieutenant (to date June 30th, 1892).

Appointments.

Sub-Lieutenants: H. F. J. Young (acting) to *Trafalgar*; C. H. Woodmans (acting) to *Boadicea* (both to date June 18th).

Naval Manœuvres.

The following appointments have been made to ships commissioned for the Naval Manœuvres (to date July 21st):—Lieutenants: Herbert A. Blake to *Arethusa*; Thomas M. Williams to *Hydra*; John D. Ross (acting) to *Mersey*; Harry N. Dewhirst (acting) to *Northampton*; Henry W. Bennett (acting) to *Glatton*; George Cawley to *Gorgon*; William J. Frazer (acting) to *Audacious*; William H. Owen to *Invincible*; David Watson (acting) to *Iron Duke*; Irvin Hayward (acting) to *Neptune*; Duncan C. Gilmour to *Superb*; Thomas D. Tod (acting) to *Swiftsure*; Charles F. Hart (acting) to *Bellerophon*. Sub-Lieutenants: Francis M. R. Carter (acting), Charles L. Coxwell (acting) to *Alexandra*, additional for disposal; Harry Calder (acting), John R. J. O'Sullivan (acting) to *Nelson*, additional for disposal. Midshipmen: Albert W. Gamlen, Gerald F. McCombie to *Alexandra*, additional for disposal.

Officers whose names are printed in italics in the Navy List are liable to removal from the list for non-attendance at drill. The following gentlemen appear in this category in the current Navy List: — Lieuts. Henry Isaac Guy, James Hamilton Fitzgerald Nixon; Sub-Lieuts. George Arthur

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Hamilton Curtis, Thomas Constantine; Midshipman John Horatio Lindquist.

WE extract the following from the Regulations for the Royal Naval College, Greenwich, published in the July Royal Navy List:—

"OFFICERS OF THE INDIAN MARINE.

"Officers of the rank of Lieutenant in the Indian Marine are, on the application of the Secretary of State for India in Council, admitted as students, under conditions similar to those laid down for officers of corresponding rank in the Royal Navy. They are permitted, if they desire it, to reside in the College, and become members of the mess.

"OFFICERS OF THE MERCANTILE MARINE, &c.

"1. Ten officers of the Mercantile Marine may, with special permission from the Admiralty in each case, be admitted annually under similar regulations as to study, &c., as are laid down for Lieutenants. They reside outside the precincts of the College, and are admitted as Honorary Members of the officers' mess.

"2. The claims of officers of the Royal Naval Reserve are first considered."

This is encouraging the Royal Naval Reserve with a vengeance. Why the Indian Marine should be pampered, and every indulgence shown it, whilst the Reserve is expected to practise self-denial and do all the hard work, is a question that will readily present itself to the minds of most Naval Reserve officers. The Admiralty are pursuing at present a course that could not be better calculated to throw a damper on the Naval Reserve movement, at least so far as the officers are concerned, and it is earnestly to be hoped that some public spirited members of Parliament will take the matter up and see justice done to the Reserve ere it is too late. Once let the Reserve get thoroughly disgusted with their treatment, and convinced that there is no redress, and "my lords" will see what will happen. No doubt their lordships will always be able to get men to accept commissions, but in the end they will get only the scum instead of the *élite* of the profession, and it will then be high time for the country to ask: "Where are the best men?"

THE following article on the Indian Marine question, from the *Army and Navy Gazette*, is so clearly and fairly written, and so much to the point, that we give it *in extenso*, merely remarking that not only does the matter need clearing up, as

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our contemporary suggests, but the obnoxious Order in Council itself requires clearing out of the Navy List altogether :—

"The recent Order in Council affecting the status of the officers of the Indian Marine has given rise to some confusion, as we opined it would. The impolicy of creating a jealousy between this service and that of the Naval Reserve is too obvious to need more than mention, but the mistake is still further complicated by the misunderstanding which has arisen in India in regard to relative rank with the regular service. On page 669*b* of the *Quarterly Navy List* is given the Order in Council, dated March 20th, 1891, and in the third paragraph it says :—'Whereas it is desirable that regulations shall be established as to rank and title of officers and men of your Majesty's Indian Marine *while borne for service in your ships constituting these floating defences*,' and then follows a table of the new titles and rank in fleet. Now the question is, Does this entitle all the Indian Marine officers to the rank and title as given in the table, or only those borne in the defence ships? The Indian Marine officers evidently think the former, for we noticed that a number of officers not borne on the books of these ships were presented at a recent Levée as 'Lieutenant So-and-So, R.I.M.' Moreover, in the list of Indian Marine officers in the body of the last *Navy List*, page 298, they are all called lieutenants and sub-lieutenants, 'formerly first and second grade officers,' as if the latter titles were abolished. But the *Indian Marine List* of the same date shows that this is not the case. Either, then, these officers have been misled by the word 'formerly,' or by the Order in Council. This matter affects, more or less directly, all the commanders and lieutenants of the regular Service serving on the East Indian station, and particularly those who are attached to the Marine Survey in India. For as things are at present all the commanders of the Indian Marine (styled officially 'Captain,' *vide Indian Marine List*) will rank before or with them. Among the officers who are thus placed above the senior lieutenants of the regular Service are several retired lieutenants, sub-lieutenants, and navigating sub-lieutenants, late of the Royal Navy, as well as a large number of *bonâ-fide* Indian Marine officers. It is true that the anomalous condition of affairs represented by a 'Captain' of Indian Marine ranking before a lieutenant Royal Navy of several years' standing is not likely to often occur, but the question is raised in the case of the Marine Survey. Commander Oldham is in charge of the Survey, with two lieutenants of Royal Navy, Gunn and Smith, as his first-class assistants. There is also attached to the Survey a Captain Searle, Royal Indian Marine, and a number of first-grade officers, styling themselves 'lieutenants.' Now what is the relative rank of these officers? Is the 'Captain' entitled to rank with the commander according to the date of his commission, or above the lieutenants Royal Navy? and what is the relative rank of the lieutenants Royal Indian Marine as regards the former? The Order in Council would seem to imply that as none of these Indian Marine officers are

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serving in defence ships they have no relative rank at all. But the matter needs clearing up."

An interesting ceremony took place on the 7th ultimo at the R.N.R. Drill Battery, at Larne, County Antrim, on the occasion of the presentation of a bronze medal and certificate of the Royal Humane Society to Thomas J. Christie, A.B., first-class Royal Naval Reserve, for his heroic conduct and bravery in saving life from drowning. In the absence of the Inspecting Commander—Captain Fanshawe, R.N.,—through ill-health, the men of the Reserve and the coastguard of the district were paraded under arms by the Battery officer, Mr. W. J. Driscoll, who said that he regretted the unavoidable absence of Captain Fanshawe and also of Lieut. J. B. White, R.N.R. (Superintendent of Mercantile Marine at Belfast), and Mr. Robert Brown, the Honorary Secretary of the Society, both of whom had written to say that business arrangements had prevented them from being present. After reading the parchment certificate, Mr. Driscoll pinned the medal on Christie's breast, and heartily congratulated him on the honour conferred upon him by the Royal Humane Society. Christie returned thanks for the compliment paid him, and desired to thank Captain Fanshawe and Mr. Driscoll for the manner in which they had permitted the presentation to be made; he also desired specially to thank Captain White for having brought his case under the notice of the Society. It is understood that Christie (who is a rigger on the Queen's Island, Belfast), has been instrumental in saving several lives of late, and fully merits the high compliment paid him.

In criticising Admiral Field's attitude on the Reserve vote, the *Army and Navy Gazette* recently said :—

"Moreover, it must be never forgotten that, in the present circumstances of Naval efficiency, no man is worth very much who loses touch of the Service for a couple of years. He is almost as much out of it, whether officer or bluejacket, as if he were a landsman, either as regards knowledge of the material and its handling, or in respect to his sea-stomach."

This is one of the strongest arguments we have yet seen put forward in favour of an efficient active list of Royal Naval Reserve officers. As a confessed opponent of the Naval Reserve, our contemporary has surely given itself away in this instance. We have frequently heard Naval officers of the old

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school declare, that looking to the large number of Naval officers on the retired and reserved lists, we don't want any Royal Naval Reserve officers; but to borrow our contemporary's expression, how about the ex-Navals' sea-stomachs, and their sea-brains, too, for the matter of that?

Touching politics, the *Admiralty and Horse Guards Gazette* says:—

"We are deeply sensible of the fact that the formation of a Gladstonian Ministry relieves the two great fighting services from the incubus of two such mal-administrators as Lord George Hamilton and Mr. Stanhope. This is neither the place nor the time wherein to indite the political epitaphs of these twin mediocrities. For six years have they been permitted to work their own sweet will upon Army and Navy to the detriment of both services. Mr. Stanhope's method of governing the Army has been condemned by every officer of rank and experience in the Army, and had no keener critics than the military officers returned to the late Parliament to support his own party. The electors of Devonport and Portsmouth—two essentially naval constituencies—have clearly and decisively shown what is their opinion and verdict upon Lord George Hamilton's administration of the Navy."

The opinion and verdict of the Royal Naval Reserve on the treatment received by them from his Lordship is pretty well known by this time, and we venture to think that his name will be remembered with bitterness by every officer of the Reserve who has a shadow of self-respect, as one who, while professing to have the interests of the Reserve at heart, has succeeded in dealing the hardest blow that has yet been dealt at the prestige of the Service. It will not be forgotten that at the very time he and his colleagues were engaged in framing the obnoxious Order in Council for the Indian Marine, he appeared as an honoured guest at the splendid banquet given in London by the officers of the Reserve in March, 1891, on which occasion he ostentatiously blew his trumpet and posed as the friend of the men whose hospitality he had accepted, and who were so soon to receive this crowning indignity at his Lordship's hands. However, let the Reserve take heart of grace; Lord George has got his walking papers, and there will be few who will mourn his departure from Whitehall, and fewer still who will ever wish to see him there again.

We congratulate Captain Halpin on the gallant fight he made at East Wicklow, where he reduced his Home Rule

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opponent's majority to 238. This is the second time he has been defeated for the same constituency, but with a decreasing majority. Try it again, Captain Halpin, there's luck in odd numbers, and you are wanted badly in the House to look after the interests of the Royal Naval Reserve.

THE Reserve will not, however, be unrepresented in the new House. Lieut. Tankerville Chamberlayne goes in for Southampton, and Lieut. T. Gibson Bowles for King's Lynn; both honorary officers it is true, but none the less interested in the welfare of the Service. We hope that the officers of the Royal Naval Reserve will be fully alive to this splendid opportunity of getting their grievances redressed. Lord Brassey (another honorary officer) is almost sure to be the First Lord in the Gladstonian administration, and with two of their brother officers in the House of Commons to support their claims, the Reserve should be able to carry all before them. *What we want is organisation.* Representative committees in Liverpool and London, working in unison to draw up a programme and formulate their demands, are what is wanted. Reserve officers should not forget, too, that there are no less than ten of their number in the House of Peers, and with two more in the House of Commons, it seems preposterous that the Reserve should not get their grievances speedily redressed. Unless they help themselves, no one will help them, and we earnestly appeal to those officers who are permanently resident ashore to be up and doing for the good name of the Service.

THE Royal United Service Institution has at last made a bold plunge, and elected to take the Banqueting House, Whitehall, as its future home, notwithstanding that the adoption of this scheme will result in a possible annual deficit of about £800. However, it is hoped that the change will lead to increased membership, which means, of course, more funds and increased usefulness of the Institution, whose claims to support we again beg to press on the notice of Reserve officers. Let every existing member become a canvassing agent for the Institution; forms of application will gladly be furnished by the Secretary, and if the Committee could see their way towards offering the inducement of life membership to everyone who secured, say, ten new annual subscribers within a certain period, the number of members would soon be doubled. To those officers of the Reserve who are not already

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members we say, *join at once*, and those who are already annual subscribers we strongly advise, the first good pay-day they have, to send a cheque for £10 to Captain Burgess, and thus become life members.

Apropos, the extremely sensible letter which appeared in a Service contemporary from Major Eustace Balfour, of the London Scottish R.V., criticising the financial position and prospects of the Institution in connection with the forthcoming change of habitation, was well-timed, and will have the effect, it is to be hoped, of making the Committee more circumspect in their future transactions. Of course the *Broad Arrow*, which enjoys a most unenviable reputation for its attitude towards Volunteers in general, sneers at the letter, and sneers at the writer as a volunteer and as an architect, although one would think the latter qualification specially fitted Major Balfour to write with authority on the subject. Military officers are notoriously bad business men, and we should like to see a few more of Major Balfour's type on the committee, which would be a guarantee that the affairs of the Institution were being conducted on strictly business principles.

A SPIRITED correspondence is still going on in the Service papers on the subject of the new decoration for long and meritorious service for Volunteer officers. Mr. Stanhope has succeeded in robbing the decoration of half its charm by carefully explaining that the reason why the decoration is not to be extended to the Militia is that the officers of that force desire specially to be connected with the officers of the Regular Army—a downright insult to the Militia, as it conveys that they wish to be taken for something that they are not; and a slight on the Volunteers as it assumes that anything is good enough for them so long as it does not provoke the jealousy of the Regular forces. The best of the joke is, however, that both the Militia and Yeomanry want the decoration and won't be happy till they get it. A "Militia Major" says straightforwardly: "Although we are proud to be linked with the Line battalions, we do not pretend, as a body, to be regulars, but we are simply an auxiliary force, and many of us would naturally feel pleased to have this mark of recognition for long service bestowed upon us." This we feel sure is an expression of much the same feeling existing in the Royal Naval Reserve, so by all means let the officers of all the auxiliary forces participate in the distribution of the decoration.

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CAPTAIN H. H. WASHINGTON, R.N., who when in command of the R.N.R. drill-ship *Durham*, at Sunderland, took a great interest in the work of the Missions to Seamen, has become a member of the committee of the Society in London.

SERVICE CORRESPONDENCE.

LETTERS TO THE EDITOR.

[*The Editor desires it to be distinctly understood that he does not hold himself responsible for the opinions expressed by correspondents.*]

THE R.N.R. AND THE INDIAN MARINE.

SIR,—The numerous letters from Naval Reserve officers in the *Nautical Magazine* show the feeling that has been raised by the "Order" in Council, that "the Indian Marine officers are to rank with but after the Royal Navy." We can sympathise with them, and especially with "Cosmo," who imagines it possible he might have to serve in an Indian Marine ship in the event of war, and be the junior of his old apprentice.

It appears, with regard to this "Order," that "someone has blundered"; but to me it seems very unlikely that the Government has intended any slight to the "Reserve," for the Reserve already rank with but after the Navy. Up till lately, the Indian Marine officers had no standing, though serving the Indian Government. Now they have been recognised; but as they are not commissioned officers, or their vessels commissioned, it is very clear that no Naval Reserve officer who holds a commission from H.M. the Queen could serve under them. The Indian Marine is not a war service, or ever will be, in my opinion. Their business is to carry troops about the Indian seas, and Government officials when going from port to port inspecting, or whatever they have to do. They have also some duties, I believe, in the Persian Gulf and Red Sea, but they are, emphatically, not a Naval service, though their ambition, I believe, is to be made one. Even, however, for the purposes mentioned they would not be missed, for "trooping" could be better done by vessels of the Mercantile Marine, say the B.I.S.N. Co., or any other line of steamers adapted for the purpose.

The steamers of the line mentioned can be got ready much sooner than the Indian Marine vessels, who are always supposed to be ready.

On the score of economy, it would be much cheaper to employ vessels of the Mercantile Marine when wanted than to keep a number of "White Elephants" (Indian Marine vessels) lying in port most of the year.

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The "duties" in the Persian Gulf and Red Sea could be done by the Navy as they are elsewhere.

If a reason exists for there being such a service as the Indian Marine, it is in the fact that the officers of the Navy take orders from no one except the Admiralty, whereas, the Indian Marine vessels are under the orders of the different Governors, Commissioners, Residents, &c., where they may happen to be. Of course, Captain Hext, R.N., the Director of the Indian Marine, is their immediate superior, through whom such orders or requisitions are given.

The expense of keeping up this service must be very great when we consider the return for the money spent.

The other day, a regiment was raised in India for service in Hong Kong, to be called the Hong Kong regiment. The P. & O. Co.'s steamer *Bombay* was employed to take this regiment from Bombay to Hong Kong, though several of the Indian Marine steamers were lying in Bombay doing nothing, nor expecting to do anything until after the S.W. Monsoon. It does not seem economical to have steamers to look at and hire others to do their work.

Indian Marine officers are, I believe, employed in the surveying vessels under Royal Naval officers.

Thirty years ago, I was about to join the "Reserve," but having to go to sea suddenly, I lost the opportunity, which I very much regret, as I have had no such opportunity since.

Your remarks as to "Lieut." Thos. R. Haggarty, R.N. (retired) late a chief carpenter in the Navy, in your June number surprised me. Surely the commander of the *Teutonic* can care nothing whether he ranks above or below Mr. Haggarty, holding, as he does, such a splendid position as commander of one of the finest vessels afloat.

Without any great stretch of imagination, we can suppose Mr. Haggarty as having served a lifetime in the Navy; respected by all those he sailed under; a man whose highest ambition was to do his duty, and on his retiring, honoured by having the rank of lieutenant bestowed upon him. Surely no one will grudge him this or think less of our gallant Reserve because he received this honorary title. I am, &c.,

At Sea, June 21st, 1892. PALINURUS.

A GROWL FROM THE QUARTER-DECK.

DEAR SIR,—As an officer in the Royal Naval Reserve I should like to draw attention to two or three things concerning

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the method of carrying on the drills on board H.M. Naval Reserve drill-ships. Let us start from the beginning. An officer, through having the necessary qualifications, receives a commission in the Reserve; he may be a commander or chief officer in some large mail line or otherwise—in fact, most of those who have joined lately are so, with, of course, the exception of midshipmen; he then presents himself in due course on board a drill-ship, and is put into the awkward squad to learn the different drills, *not*, as he naturally expects, with another officer, but with perhaps an ordinary seaman or two, or A.B.'s who have joined at the same time as he has, and who may very probably have belonged to the ship that he was commander or chief officer of, which is most uncomfortable for both parties. When he rises to the second and first classes he has to drill in the same way—with the men—three-fourths of whom do not take the slightest interest in their work, and who, I believe, only join it so as to have something to do when they are out of a ship, and who are laughing and cracking (very often obscene) jokes amongst themselves the whole time, and, I am sorry to say, are very seldom checked by the instructors, who, with few exceptions, will laugh and talk with the men whilst on duty, except when the commander, gunner, or chief petty officers are present, of whom they stand in great awe. Now this state of affairs is very detrimental to officers who wish to learn their work quickly, and who certainly do not come there to spin yarns, &c. Also, I have frequently noticed that the men on board are not by any means as respectful as they should be, or as they would be in the merchant service, which I put down, of course, to the familiarity of the instructors. What ought to be done is this: Officers should drill by themselves entirely, as it is not pleasant or desirable for an officer to be put in the ranks with men who have been under him, and who, perhaps, have the misfortune to be black, as I saw an officer object the other day to being put next to a coloured man in the same ship, and with whom he may have had trouble.

Another thing which I think ought to be suppressed is the tipping of the junior instructors, which is getting a nuisance; someone started it, and now it has grown into a regular custom, which I certainly do not think is right by any means.

Hoping you will find room for this in your next issue, as there are several officers who think as I do, and, enclosing my card for reference,

I am, &c.,

Sunderland, July 18th. A. J. B.

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO JULY 2ND.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Agamemnon ...	6	380	D.S. Bat.-ship, 1st cl.	Capt. C. Johnstone	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	... ...	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Australia ...	12	461	... ...	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Bellona ...	6	168	D.S. Cruiser, 3rd class	Comm. H. D. Barry	May 14, 1892, Devonport	Channel Squadron.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Cleopatra ...	14	280	... ...	Capt. W. M. Lang	Nov. 29, 1888, Devonport	On passage home.
Collingwood ...	10	420	... ...	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	... ... Malta ...	Mediterranean.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Howe	10	523	... ...	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5,'89, Hong Kong	China.
Mercury ...	13	280	... ...	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Pylades ...	14	161	S. Cruiser, 3rd class	Comm. J. B. Young	Re-c. Nov. 13,'89, Bermuda	N. America and W. Indies.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	...	D.S. Bat.-ship, 1st cl.	... ...	... ...	Channel Squadron.
Sans Pareil ...	15	583	... ...	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	... ...	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Trafalgar ...	10	550	D.S. Bat.-ship, 1st cl.	Capt. G. C. Robinson ... (R.-Ad. A. H. Markham.)	April 2, 1890, Portsmouth	Mediterranean.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.

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QUARTERLY LIST OF THE ROYAL NAVAL RESERVE OFFICERS AND SHIPS AUTHORISED TO FLY THE BLUE ENSIGN.

QUARTER ENDED 30TH JUNE, 1892.

Name and Rank of Officer.		Name and Official Number of Vessel.		Number and Date of last issue of Warrant.	
W. C. Crutchley ...	Lieutenant	*Kaikoura*	89,627	183	10 Feb., 1885
E. J. Griffin	,,	*Moor*	82,428	169	18 Mar., 1886
W. B. Andrews ...	Hon. Lieut.	*Arcadia*	93,172	210	29 Sept., 1888
A. S. Thomson ...	Lieutenant	*Silvertown* ...	68,421	216	4 Mar., 1889
A. McKay	,,	*Janet Cowan* ...	93,219	222	7 June, 1889
W. H. Kidley	Hon. Lieut.	*Ionic*	86,299	225	26 July, 1889
J. Wilson...	Lieutenant	*Ethiopia*	68,064	230	18 Sept., 1889
J. Bone	,,	*Tongariro* ...	76,067	231	30 Sept., 1889
F. S. Land	Hon. Lieut.	*City of Berlin*...	70,913	232	10 Oct., 1889
E. H. T. Freeth ...	Lieutenant	*British Princess*	87,817	234	11 Oct., 1889
R. F. Briscoe	Hon. Lieut.	*Valetta*	87,395	235	14 Oct., 1889
R. G. Murray	,,	*Parramatta* ...	87,377	238	11 Dec., 1889
W. R. Cato	,,	*Scotia*	43,711	240	1 Feb., 1890
W. E. White	Lieutenant	*Ormus*	93,341	246	15 May, 1890
C. K. McIntosh ...	,,	*Benalder*	82,011	248	19 May, 1890
R. J. M. Barker ...	,,	*Orion*	96,410	250	10 July, 1890
T. Campbell	,,	*Narva*	88,157	249	30 July, 1890
F. Davies...	,,	*Radnorshire* ...	98,155	251	6 Sept., 1890
C. Stuart	,,	*Inyoni*	98,544	254	27 Oct., 1890
R. Reynolds	,,	*Pretoria*	76,844	186	31 Oct., 1890
D. Stuart	,,	*Tekoa*	97,473	258	10 Dec., 1890
A. H. H. G. Douglas	,,	*Damascus* ...	94,521	259	13 Dec., 1890
J. Kennedy	,,	*Calabria*	19,492	261	23 Jan., 1891
D. Campbell	,,	*Taroba*	95,056	263	2 Mar., 1891
C. H. Kempson ...	,,	*Coptic*	84,164	203	29 May, 1891
E. J. Smith	,,	*Britannic* ...	69,368	221	29 May, 1891
W. H. Moore	,,	*Queensmore* ...	96,394	268	13 June, 1891
R. Barrett	Hon. Lieut.	*Mongolian* ...	98,605	269	4 July, 1891
J. A. Patterson ...	Lieutenant	*Crompton* ...	97,800	271	7 July, 1891
R. W. Padgett ...	Sub.-Lieut.	*Sledmere*	98,723	273	20 Oct., 1891
G. G. C. Stevenson	Lieutenant	*Avoca*	98,663	274	1 Sept., 1891
G. H. Harris	,,	*Cheshire*	99,310	275	4 Sept., 1891
G. W. Banks	,,	*Otarama*	98,081	276	9 Oct., 1891
J. Cuthbert	,,	*Fifeshire*	95,010	278	20 Oct., 1891
J. Templeton	Hon. Lieut.	*Roma*	68,049	279	22 Oct., 1891
J. Cameron	Lieutenant	*Germanic* ...	70,932	280	27 Oct., 1891
W. A. Millar	,,	*Elginshire* ...	98,671	281	3 Nov., 1891
H. G. Thomas ...	,,	*Yarrawonga* ...	99,007	282	11 Nov., 1891
T. Johnson	,,	*India*	85,861	283	1 Dec., 1891
T. J. Jones	Sub.-Lieut.	*Cufic*	93,825	284	16 Dec., 1891
Temperley Darke ...	Lieutenant	*Glenfalloch* ...	68,036	285	31 Dec., 1891
W. C. Haynes... ...	Lieutenant	*Belgravia* ...	85,911	289	8 April, 1892
J. C. Dodd	,,	*Manchester* ...	99,391	290	14 April, 1892
F. Mayoss	Sub.-Lieut.	*Ruapehu*	76,069	291	14 April, 1892
W. Easterbrook ...	Lieutenant	*Canopus*	63,338	292	16 April, 1892
F. P. Horsfall... ...	Sub.-Lieut.	*Travancore* ...	99,769	293	5 May, 1892
A. W. Clarke	,,	*Orizaba*	93,688	294	5 May, 1892
W. F. Caborne ...	Lieutenant	*Ceylon*	22,173	295	16 May, 1892

The above list is issued by the Admiralty for the information of captains of Her Majesty's ships, with reference to the provisions of Article 85 of the Queen's Regulations, under which they are authorised to ascertain whether British merchant ships flying the Blue Ensign of Her Majesty's Fleet, are legally entitled to do so under the Regulations of the Royal Naval Reserve.

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Royal Naval Reserved Merchant Cruisers.

(These vessels being in receipt of Annual Subvention are permitted to fly the Blue Ensign.)

Name and Rank of Officer.		Name of Vessel.
W. H. P. Hains	Hon. Lieutenant ...	*Etruria.*
H. McKay	,, ...	*Umbria.*
———	———	*Victoria.*
J. Orman	Hon. Lieutenant ...	*Britannia.*
———	,, ...	*Oceana.*
F. Watkins	,, ...	*City of Paris.*
———	———	*City of New York.*
P. J. Irving	Lieutenant	*Teutonic.*
H. Parsell	Hon. Lieutenant ...	*Majestic.*
O. P. Marshall	Sub-Lieutenant ...	*Empress of India.*
G. A. Lee	Lieutenant	*Empress of Japan.*
———	———	*Empress of China.*

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TIDE TABLES FOR AUGUST, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields.		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown.		Kingstown.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
M	1	7 8	7 29	11 56	—	8 52	9 20	7 47	8 14	10 30	10 54	4 15	4 36	11 43	—	4 12	4 38	4 59	5 22	10 7	10 33	4 17	4 44	1 22	1 54	9 2	9 29
Tu	2	7 52	8 20	0 24	0 58	9 51	10 24	8 44	9 17	11 22	11 54	5 0	5 27	0 9	0 39	5 8	5 41	5 49	6 19	11 4	11 38	5 13	5 45	2 28	3 1	10 0	10 35
W	3	8 52	9 29	1 23	1 54	10 58	11 33	9 52	10 27	—	0 30	5 57	6 30	1 12	1 48	6 19	6 58	6 52	7 28	—	0 14	6 15	6 48	3 33	4 5	11 13	11 53
Th	4	10 8	10 46	2 27	3 1	—	0 8	11 1	11 35	1 7	1 44	7 6	7 44	2 27	3 7	7 35	8 11	8 5	8 43	0 52	1 30	7 22	7 56	4 36	5 5	—	0 31
F	5	11 24	11 59	3 36	4 10	0 42	1 13	—	0 6	2 22	3 1	8 20	8 51	3 46	4 22	8 44	9 13	9 18	9 49	2 7	2 40	8 29	9 1	5 32	5 56	1 6	1 36
S	6	—	0 29	4 39	5 5	1 40	2 4	0 34	0 58	3 38	4 10	9 19	9 45	4 54	5 24	9 38	10 1	10 17	10 42	3 9	3 36	9 30	9 56	6 20	6 48	2 2	2 27
S	7	0 55	1 19	5 28	5 51	2 27	2 49	1 22	1 45	4 36	5 0	10 10	10 34	5 51	6 17	10 24	10 46	11 7	11 32	4 1	4 25	10 19	10 39	7 6	7 29	2 50	3 11
M	8	1 43	2 5	6 18	6 35	3 10	3 30	2 7	2 28	5 23	5 45	10 58	11 21	6 41	7 3	11 8	11 29	11 55	—	4 47	5 9	10 58	11 18	7 51	8 11	3 32	3 53
Tu	9	2 24	2 44	6 57	7 19	3 50	4 10	2 48	3 7	6 7	6 29	11 44	—	7 25	7 46	11 50	—	0 17	0 39	5 31	5 52	11 38	11 58	8 30	8 48	4 14	4 34
W	10	3 4	3 25	7 39	7 59	4 30	4 50	3 26	3 46	6 50	7 9	0 6	0 28	8 5	8 24	0 11	0 31	1 0	1 20	6 12	6 32	—	0 19	9 6	9 25	4 54	5 14
Th	11	3 44	4 5	8 19	8 39	5 11	5 32	4 6	4 27	7 29	7 49	0 50	1 12	8 43	9 2	0 51	1 11	1 40	2 0	6 52	7 12	0 40	1 1	9 44	10 3	5 34	5 54
F	12	4 26	4 46	8 59	9 20	5 53	6 14	4 48	5 9	8 9	8 29	1 34	1 55	9 21	9 40	1 31	1 51	2 20	2 40	7 32	7 52	1 22	1 44	10 23	10 44	6 14	6 35
S	13	5 6	5 27	9 41	10 2	6 36	6 58	5 31	5 54	8 49	9 9	2 16	2 38	9 59	10 17	2 11	2 31	3 0	3 20	8 12	8 33	2 6	2 28	11 6	11 32	6 56	7 18
S	14	5 48	6 10	10 24	10 48	7 21	7 46	6 18	6 43	9 29	9 51	3 0	3 22	10 35	10 54	2 52	3 14	3 41	4 4	8 55	9 17	2 51	3 15	—	0 2	7 41	8 5
M	15	6 33	6 58	11 15	11 45	8 18	8 42	7 9	7 37	10 15	10 40	3 44	4 8	11 15	11 40	3 38	4 4	4 27	4 52	9 40	10 6	3 40	4 7	0 34	1 9	8 30	8 58
Tu	16	7 24	7 52	—	0 19	9 15	9 58	8 9	8 46	11 7	11 39	4 34	5 3	—	0 11	4 34	5 10	5 19	5 51	10 36	11 14	4 39	5 15	1 48	2 31	9 31	10 12
W	17	8 26	9 6	0 55	1 32	10 34	11 15	9 27	10 10	—	0 17	5 36	6 13	0 48	1 30	5 53	6 38	6 30	7 11	11 56	—	5 53	6 32	3 12	3 50	10 56	11 42
Th	18	9 49	10 34	2 11	2 51	11 57	—	10 51	11 30	0 58	1 40	6 55	7 39	2 15	3 2	7 24	8 7	7 54	8 38	0 40	1 26	7 12	7 52	4 36	5 0	—	0 26
F	19	11 18	mid.	3 31	4 10	0 57	1 19	—	0 7	2 24	2 8	8 20	8 57	3 47	4 29	8 45	9 18	9 18	9 55	2 9	2 47	8 30	9 7	5 30	5 59	1 6	1 41
S	20	—	0 34	4 44	5 18	1 44	2 12	0 39	1 6	3 48	4 20	9 28	9 55	5 6	5 36	9 46	10 10	10 26	10 52	3 19	3 46	9 39	10 5	6 27	6 52	2 11	2 36
S	21	1 1	1 28	5 37	6 0	2 36	2 57	1 31	1 53	4 47	5 10	10 20	10 43	6 1	6 25	10 32	10 53	11 16	11 39	4 11	4 33	10 26	10 45	7 15	7 36	2 58	3 18
M	22	1 52	2 12	6 22	6 43	3 17	3 36	2 14	2 34	5 31	5 52	11 5	11 26	6 47	7 8	11 18	11 33	—	0 1	4 54	5 14	11 4	11 22	7 56	8 15	3 38	3 58
Tu	23	2 31	2 49	7 2	7 20	3 54	4 12	2 52	3 9	6 12	6 30	11 46	—	7 27	7 44	11 52	—	0 25	0 41	5 33	5 51	11 40	11 57	8 32	8 47	4 17	4 34
W	24	3 7	3 23	7 38	7 54	4 29	4 46	3 25	3 41	6 47	7 3	0 5	0 23	8 0	8 15	0 9	0 26	0 59	1 16	6 8	6 24	—	0 14	9 1	9 15	4 49	5 4
Th	25	3 41	3 57	8 10	8 25	5 2	5 18	3 57	4 13	7 17	7 31	0 40	0 57	8 30	8 45	0 42	0 58	1 32	1 47	6 39	6 54	0 31	0 47	9 30	9 45	5 19	5 34
F	26	4 13	4 28	8 40	8 55	5 34	5 50	4 29	4 45	7 45	7 59	1 14	1 31	8 59	9 18	1 18	1 38	2 2	2 17	7 9	7 24	1 8	1 19	10 0	10 15	5 49	6 4
S	27	4 44	4 58	9 10	9 26	6 6	6 22	5 1	5 17	8 18	8 27	1 47	2 3	9 27	9 40	1 48	1 58	2 32	2 47	7 39	7 54	1 35	1 51	10 30	10 46	6 20	6 36
M	28	5 12	5 27	9 42	9 58	6 38	6 54	5 33	5 50	8 40	8 53	2 18	2 33	9 53	10 6	2 12	2 26	3 2	3 16	8 9	8 23	2 7	2 24	11 4	11 24	6 52	7 8
Tu	29	5 48	6 0	10 14	10 32	7 11	7 31	6 8	6 27	9 8	9 24	2 49	3 6	10 19	10 34	2 42	2 59	3 31	3 48	8 39	8 57	2 41	2 59	11 47	—	7 26	7 46
W	30	6 18	6 37	10 55	11 22	7 58	8 19	6 49	7 14	9 42	10 2	3 24	3 45	10 52	11 14	3 18	3 40	4 7	4 29	9 17	9 40	3 20	3 44	0 14	0 45	8 8	8 33
Th	31	6 59	7 24	11 52	—	8 49	9 24	7 48	8 17	10 26	10 54	4 8	4 36	11 43	—	4 8	4 41	4 58	5 23	10 8	10 44	4 18	4 47	1 20	2 0	9 3	9 40

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 3	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 21	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbeliton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 23	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 58	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 33	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 18	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 48	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 58	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
318	England—Thames Entrance—Maplin Spit	Gas buoy moved in position.
319	„ E. Cst.—Smith's Knoll	Fog-signal altered.
320	„ „ Kentish Knock, &c.	Alterations.
321	„ „ Tees Bay—Seaton	Lights discontinued.
322	„ „	Sounding operations.
323	„ W. Cst.—Liverpool Bay—Constable	Buoy altered.
324	„ Bristol Chan.—One Fathom Bank	Buoys transposed.
325	Scotland—Sound of Harris—Jane Tower Is.	No sunken rock.
326	„ Hebrides—Sound of Monach—Causameal	Sunken rock.
327	Ireland—Galway Bay—Mutton Is.	Light to be altered in November.
328	France—N. Cst.—Somme River	Alteration in lights.
329	Baltic Entrance—Kattegat—Fernoes	Fog-signal.
330	Mediterranean — Spain — Cartagena — Escombrera Is.	Light altered.
331	„ „ Gandia	Harbour works and light.
332	„ Corsica—Bastia	No night signals.
333	„ Algeria—Philippeville	Light buoys.
334	„ Ionian Is.—Santa Maura	Harbour lights.
335	„ „ Cephalonia — Phiscardo Pt.	Light altered.
336	„ „ Gulf of Kalamata—Cape Kitries	New light.
337	„ Greece—G. of Athens—Phleva Is.	New light.
338	„ Grecian Arch.—G. of Nauplia—Leonidi	Harbour light.
339	„ „ G. of Nauplia—Spezzia Str.—Kheli	Harbour light, &c.
340	„ „ Santorin Is.—C. Akrsteri	New light.
341	„ Mitylení Chan. — Kabakoum Bay—Dikili	Amended position of lights.
342	North Atlantic—Azores—San Miguel—Ponta Delgada	Harbour lights.
343	„ C. Verde Is.—Sal Is.—S. Pt.	New light.
344	South Atlantic—	Icebergs.
345	Africa—E. Cst.—River Pungue	Shoal in fairway.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
346	AFRICA.—E. Cst.—Kiliman River	Shoal patch.
347	„ „ „	Fairway buoy placed.
348	INDIAN OCEAN—Saya de Malha Bank	
349	GULF OF ADEN—Aden Harbour	Increased depth.
350	INDIA—W. Cst.—Bombay	Buoyage.
351	„ „ Narrakel	Directions.
352	BAY OF BENGAL—Burma—Rangoon River	Uniform buoyage.
353	MALACCA STRAIT—Penang Harb.—S. Chan.	Alterations in light, &c.
354	BORNEO—Darvel Bay—Darvel Peninsula	Shoal spot.
355	SULU SEA—Palawan Is.—Ursula Is.	Dangerous shoal.
356	CHINA SEA—Macclesfield Bank	Shoal spots.
357	CHINA—Kaipong Is.—Hong Kong—Gap Rock	Amended particulars of light.
358	JAPAN—Inland Sea—Misima Nada	Track doubtful.
359	„ Yezo Is.—Hakodate Harb.—Kattoji Saki	Fog-signal.
360	AUSTRALIA—E. Cst.—Keppel Bay—Little Sea Hill	Red sector of light.
361	„ „ Moreton Bay—Howe Chan. —East Bank.	Sand spit.
362	„ S. Cst.—Encounter Bay—Port Victor —Granite Is.	New light.
363	BERING SEA—Bering Is.—Nikolski Anchorage	Sunken rocks.
364	N. AMERICA—W. Cst.—Queen Charlotte Is.— Houston Stewart Chan.	Rocks in fairway.
365	UNITED STATES—Chesapeake Bay—Shark Fin	New light, &c.
366	„ New York—Long Is. Sound— Execution Rocks	Particulars of light.
367	NOVA SCOTIA—Halifax Harb. Entrance	Shoal depths.
368	NEWFOUNDLAND—Miquelon Is.—Seal Rocks	Dangerous shoal.
369	„ Cape Race	Bank to S.W.

NAUTICAL NOTICES.

All bearings Magnetic unless otherwise stated.

318.—ENGLAND.—*Thames Entrances.—West Swin.—Maplin Spit.—Gas Buoy.*—In conformity with previous notice, this buoy has now been moved three-quarters of a cable S.W. ½ W. from its former position, and now lies in 47 ft. L.W. springs, with the following mark and bearing:—The west side of East Newland trees touching the N.E. pile of the Maplin lighthouse, N.W. ¾ W. Wly.; Maplin lighthouse, N.W. by W. The subsidiary *F. white* light, which is shown from the Maplin lighthouse, has been moved so as to cut over the buoy as heretofore.

319.—ENGLAND.—*East Coast.—Alteration in Character of the Smiths Knoll Fog-Signal.*—In accordance with previous notice, the character of this fog-signal has now been changed from two blasts (high, low) every two minutes, to *two blasts* (*low*, *high*) *every two minutes.*

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320.—ENGLAND.—*East Coast.—Alteration in Position of the Kentish Knock Light-Vessel and Longsand Head Bell Buoy.*—In accordance with previous notice, the positions of the above-mentioned sea-marks have now been altered as follows :—(1.) The Kentish Knock light-vessel has been moved 1¼ mile W.N.W. of its former position, and now lies in 11½ fathoms at L.W. springs, with the following bearings :—Longsand light-vessel, N. by E. ¾ E., distant 8 5/10ths miles ; North Foreland light-house, S.W., distant 18 3/10ths miles ; Middle Knock buoy, S.W. Wly., distant 2 1/10th miles ; North Knock buoy, N. ¼ E. Ely., distant 8 7/10ths miles. The Watch buoy has been placed W.N.W. four cables distant from the light-vessel. (2.) The Longsand Head bell buoy has been moved five cables S.W. by W. ½ W. of its former position, and now lies in 40 ft. at L.W. springs, with the following bearings :—Longsand light-vessel, E. ¾ N., distant 2 3/10ths miles ; Kentish Knock light-vessel (new position), S. ½ W. Wly., distant 8 1/10th miles ; Sunk Head buoy, W. ½ N. Nly., distant 5 6/10ths miles ; Sunk light-vessel, N.N.W. ½ W. Wly., distant 5 9/10ths miles.

321.—ENGLAND.—*East Coast.—Tees Bay.—Seaton Lights.—Intended Discontinuance.*—On August 31st, 1892, Seaton high and low lights, west shore of Tees bay, will be discontinued, and the lighthouses removed, being no longer required for the guidance of vessels entering river Tees. Approx. position, lat. 54° 40′ N., long 1° 12′ W.

322.—ENGLAND.—*East Coast.—Sounding Operations.*—During the months of July and August, 1892, H.M. surveying-vessel *Triton* will be sounding between the north end of Outer Dowsing shoal and the Silver pit, and will be occasionally at anchor in the direct track of vessels between Flamborough head and Cromer. The *Triton* will probably be accompanied by a fishing-smack to aid in the surveying operations. Mariners are cautioned accordingly, and are requested to avoid as much as possible fouling any marks laid down for surveying purposes.

323.—ENGLAND.—*West Coast.—Liverpool Bay.—Constable Buoy.*—This buoy has been moved three miles N.W. by W. ½ W. from its former position, so as to mark the west end of the shoal, and is now named the West Constable. Further particulars will be given.

324.—ENGLAND.—*Bristol Channel.—One Fathom Bank Buoys.*—The buoys marking the One-Fathom Bank have been transposed, that is to say, the larger buoy has been placed at the West End of the shoal, the smaller one being shifted to the East End. The diamond top mark will be as heretofore on the western buoy, and the triangle on the eastern one.

325. — SCOTLAND. — *West Coast. — Sound of Harris. — Obb Point Approach.—Non-existence of Sunken Rock N.W. of Jane Tower Islet.*—With reference to Notice 281, p. 667, the channel in the approach to Obb point with the beacons in line was found to be quite clear of dangers. No sunken rock exists close northward of the direction of the beacons in line, but shoal water extends north-westward of Jane Tower islet farther than heretofore charted, there being a depth of 9 ft. with Jane Tower

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bearing S. 49° E., distant nearly two-thirds of a cable. Care should be taken therefore to give Jane Tower islet a fairly wide berth. Approx. position of Jane Tower, lat. 57° 45′ 45″ N., long. 7° 2′ W. *Variation*, 23° *W.* Depths L.W. springs.

326.—SCOTLAND.—*West Coast.—Hebrides.—Sound of Monach.—Particulars of Sunken Rock Westward of Causameal.*—With reference to Notice 280, p. 667, a dangerous rocky patch, about one cable in extent in a north and south direction, with a breadth of half a cable, and having a least depth of 10 ft. on it, with 3½ fathoms inshore, lies (shoalest spot) with Causameal summit (25 ft.) bearing S. 89° E., distant 2¼ cables. In heavy weather the sea probably breaks on this patch. Depths L.W. springs. Approx. position, lat. 57° 35′ 55″ N., long. 7° 36′ W.

327.—IRELAND.—*West Coast.—Galway Bay.—Mutton Island.*—On or about the 1st November, 1892, the present fixed light on Mutton island, Galway bay, will be changed to a *quick occulting* bright light. It will show *white* in the fairway between Blackrock and Margaretta shoal, *red* from W. ¾ S. to northward to guard Blackrock, and *red* W. by S. ½ S. to S.W. ¾ W. to guard the Margaretta shoal, and *white* from the latter bearing over Galway harbour.

328.—FRANCE.—*North Coast.—Somme River Approach.—Intended Alterations in Lights.*—(1.) The present *F. and Fl. white* light at Cayeux will be replaced by a *quick flashing* light of 5th order, showing a sector of *white* light over South passage, Somme river entrance, a sector of *red* light northward of the white sector, and a sector of *green* light southward of it.

(2.) During the time occupied in altering Cayeux light, a *F. white* light of 5th order will be provisionally shown from the gallery of that lighthouse. Approx. position, lat. 50° 11¾′ N., long. 1° 31′ E.

(3.) A *F. and Fl. white* light of 3rd order, showing a sector of *red* light over the banks at Somme river entrance, will be exhibited from the recently erected lighthouse near Ault, about 6 miles S.W. of Cayeux principal lighthouse. Approx. position, lat. 50° 6¼′ N., long. 1° 27′ E. Further notice will be given of date of alterations.

329.—BALTIC ENTRANCE.—*The Kattegat.—Danish Coast.—Fog-Signal near Fornæs Lighthouse.*—Established near the lighthouse at Fornæs, west shore of the Kattegat. This fog-signal is a siren of the first class, which will give a blast of *about five seconds'* duration *every minute.* The siren is placed on an iron support, 44 ft. high, and situated about 40 yards S.E. from the lighthouse. Approx. position, lat. 56° 26¼′ N., long. 10° 57¾′ E.

330.—MEDITERRANEAN.—*Spain.—Cartagena Harbour Approach.—Escombrera Island Light.—Alteration in Colour.*—With reference to Notice 288, p. 668, on 1st July, 1892, the date on which Podadera point light would be discontinued, the *fixed red* light shown from Escombrera island lighthouse, Cartagena harbour approach, would be replaced by a

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F. white light of the same order. Approx. position, lat. 37° 33½′ N., long. 0° 58′ W.

331.—MEDITERRANEAN.—*Spain. — Gandia. — Harbour Works and Light.*—With reference to notice in 1889 a North and South breakwater have been partially constructed at Gandia, which enclose the new harbour. The North breakwater extends in an east and S.E. direction from the shore, a distance of about 650 yards. The South breakwater extends in an east and N.E. direction from the shore, a distance of about 380 yards. The entrance of the harbour will be about half a cable in width. A *F. red* light, elevated 35 ft. above the sea, and visible about 6 miles, is exhibited from near the outer extreme of the North breakwater in course of construction at Gandia. This light is shown from a staff on a carriage, which will be moved outwards as the works progress; it now stands about 612 yards from the shore, and 38 yards within the end of the breakwater. Approx. position, lat. 38° 59½′ N., long. 0° 9′ W.

332. — MEDITERRANEAN. — *Corsica. — East Coast. — Bastia. — Non-Existence of Night-Signals.*—With reference to Notice 239, p. 578, there are no night-signals in general use at Bastia, the only signals shown being for the use of vessels in the employ of certain private companies.

333.—MEDITERRANEAN.—*Algeria.—Philippeville. — Light Buoys at Entrance.*—The French Government has given notice that, on 4th June, 1892, lights, as undermentioned, were exhibited from two buoys placed to mark the entrance to the port of Philippeville:—(1.) A *F. red* light is shown from a buoy, painted black, and moored in 11 fathoms water, in line with the extension of the North pier, and about 366 yards from its present head. This buoy should be left on the port hand entering. (2.) A *F. green* light is shown from a buoy, painted red, and moored in 6 fathoms water, 88 yards N.W. by N. from the outer extremity of Chateau Vert pier. This buoy should be left on the starboard hand entering. *Variation*, 12° *W.* These buoys mark the entrance to the port of Philippeville.

334.—MEDITERRANEAN.—*Ionian Islands.—Santa Maura Island.—Santa Maura Road.—Harbour Lights.*—With reference to notice in 1891, a *F. green* light, elevated 24 ft. above the sea, and visible 4 miles, is exhibited from the outer extreme of the mole. Approx. position, lat. 38° 50½′ N., long. 20° 44′ E. This light, and another light shortly to be exhibited on the north bastion of the fort at Santa Maura, will be in lieu of the light destroyed in January, 1891.

Note.—Vessels should round the mole head at the distance of about one-third of a cable.

335.—MEDITERRANEAN.—*Ionian Islands.—Cephalonia.—Alterations in Phiscardo Point Light.*—This is a *F. white* light, obscured by the land westward of the bearing S. 18° E., elevated 90 ft. above the sea, and visible 9 miles. Ill. app. dioptric of 6th order. Lighthouse, 48 ft. high, is a square masonry tower, situated about 142 yards northward of

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the extreme of the point, and 76 yards northward of the old lighthouse. Approx. position, lat. 38° 27½′ N., long. 20° 36′ E. *Variation*, 7° *W.*

336.—MEDITERRANEAN.—*Ionian Sea.—Gulf of Kalamata.—Light on Cape Kitries.*—This is a *Fl. white* light, showing a *flash every thirty seconds*, elevated 102 ft. above the sea (36 ft. above the ground), and visible 10 miles. Ill. app. dioptric of 6th order. Approx. position, lat. 36° 54′ 45″ N., long. 22° 8′ 20″ E.

337.—MEDITERRANEAN.—*Greece.—Gulf of Athens.—Light on Phleva Island.*—A light is now exhibited from a lighthouse erected on Phleva island summit (about 760 yards N.E. of the S.W. point of the Island), eastern shore of the gulf of Athens. It is an *Occ. white* light, eclipsed for *one second every four seconds;* elevated 266 ft. above the sea, and visible 12 miles. Ill. app. dioptric of 5th order. Lighthouse, 22 ft. high, a square masonry tower, with keeper's dwelling near. Approx. position, lat. 37° 45′ 50″ N., long. 23° 46′ E. *Variation*, 6° *W.*

338.—MEDITERRANEAN.—*Grecian Archipelago.—Gulf of Nauplia.—Harbour Light at Port Leonidi.*—A harbour light is exhibited from an iron pole with shed erected at port *Leonidi* (also named *Plaka*), western shore of the gulf of Nauplia. It is a *F. red* light, elevated 36 ft. above the sea (20 ft. above the ground), and visible 5 miles. Approx. position, lat. 37° 9′ N., long. 22° 54′ E.

339.—MEDITERRANEAN.—*Grecian Archipelago.—Gulf of Nauplia.—Spezzia Strait.—Harbour Light and Beacon at Port Kheli Entrance.*—Exhibited from an iron pole with shed erected near the S.W. extreme of the north point of entrance to port Kheli, northern shore of Spezzia strait. It is a *F. red* light, elevated 69 ft. above the sea (20 ft. above the ground) and visible 5 miles. Approx. position, lat. 37° 18′ 40″ N., long. 23° 8′ 55″ E. Also, a cylindrical beacon of masonry, and 12 ft. high, has been erected on Kaluiri rock, south side of entrance to port Kheli.

340.—MEDITERRANEAN.—*Grecian Archipelago.—Santorin Island.—Light on Cape Akroteri.*—It is a *Fl. white* light *every thirty seconds*, elevated 321 ft. above the sea, and visible 22 miles. Ill. app. dioptric of 3rd order. Lighthouse, 35 ft. high, of masonry and square in shape, with keeper's dwelling near, is situated about 380 yards eastward of the extreme of the cape. Approx. position, lat. 36° 21′ 15″ N., long. 25° 22′ 15″ E.

341.—MEDITERRANEAN.—*Mityleni Channel.—Kabakoum Bay.—Amended Position of Lights at Dikili.*—With reference to Notice 108, p. 281, the lights (*F. white*, vertical) at Dikili are situated with the chiflik, east shore of Kabakoum bay, bearing E. by S. ½ S., distant about 350 yards. Approx. position, lat. 39° 4′ 30″ N., long. 26° 54′ 15″ E. *Variation*, 5° *W.*

342.—NORTH ATLANTIC.—*Azores.—San Miguel.—Ponta Delgada.—Harbour Lights.*—(1.) The *white* light on the buoy near the extremity of the breakwater in progress has been replaced by a *F. red* light. (2.)

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The lighthouse near the centre of the breakwater, from which is shown a *F. red* light, will be moved to the eastern extremity of the breakwater, when it is completed. (3.) The *white* light at the Custom house is not visible seaward, owing to the progress of the breakwater, and is only of use to vessels and boats in the harbour.

Note.—Vessels entering the harbour at night should approach to a convenient distance eastward of the light buoy near the extremity of the breakwater, and signal for a pilot, and are recommended not to enter without one.

343.—North Atlantic.—*Cape Verde Islands.—Sal Island.—Light on South Point.*—This is a *F. white* light, visible through an arc of 280° or from the bearing of S. 8° E., through east, to N. 53° W.; elevated 31 ft. above H.W., and seen about 8 miles. Ill. app. dioptric of 6th order. Lighthouse, 19 ft. high, is a square iron structure, painted red, situated about 328 yards from the extreme of the point. A shed, painted green, stands N.W. of it. Approx. position, lat. 16° 84½′ N., long. 22° 56½′ W. *Variation*, 20° *W.*

344.—South Atlantic.—*Icebergs in Lat.* 46° *S., Long.* 36° *W.*—The commander of the British ship *Cromdale* reports having sighted, in April, 1892, large numbers of table-topped icebergs of enormous size, when in lat. 46° S., long. 36° W. Mariners are warned accordingly. During the last 70 years, very extensive masses of ice have been from time to time found in this locality, *vide* Admiralty Ice Chart of the Southern Hemisphere, No. 1241.

345.—Africa.—*East Coast.—River Pungue.—Shoal in Fairway of Entrance.*—Commander F. Finnis, H.M.S. *Swallow*, reports the existence of a shoal, with 8 ft. on it at L.W. springs (over sand and mud), lying in the fairway of the entrance to river Pungue, with Chiveve point bearing N.N.E. ¼ E., and Massique point N. by W. ¾ W., distant $2\frac{2}{10}$ths miles. Approx. position, lat. 19° 54′ S., long. 34° 51′ E. *Variation*, 19° *W.*

346.—Africa.—*East Coast.—Kilimán River Entrance.—Shoal Patch within the Bar.*—A shoal patch, with 7 ft. on it at L.W. (bottom fine sand), lies within the bar, Kilimán river entrance, with Tangalane point lighthouse bearing N. 15° E., distant $2\frac{8}{10}$ths miles, and Ponta Olinda N. 22° W. *Variation*, 16° *W.*

347.—Africa.—*East Coast.—Kilimán River Entrance.—Fairway Buoy Placed.*—A fairway buoy has been placed outside the bar at Kilimán river entrance, with Tangalene point flagstaff bearing N. by E. ¼ E., distant 5 miles. The buoy is *spherical*, painted black and white in horizontal stripes, and surmounted by a staff and cage. Approx. position, lat. 18° 6′ S., long. 36° 58′ E. *Variation*, 16° *W.*

Note.—No. 3 buoy was not in position in April, 1892.

Caution.—The buoys in Kilimán river cannot be relied on.

348.—Indian Ocean.—*Saya de Malha Bank.—Shoal Soundings on Northern Edge.*—The commander of the Messageries Maritimes steam-

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vessel *Armand Béhic*, reports having seen the bottom on the northern edge of Saya de Malha bank, soundings of 4¾, 6, and 6¼ fathoms were obtained in about lat. 9° 45′ S., long. 61° 25′ E. This has been placed on the Admiralty charts as the Poydenot shoal.

349.—Gulf of Aden.—*North Shore.—Aden Harbour.—Increased Depth in Channel.*—The port-master at Aden reports that the dredging completed up to the present time has resulted in the establishment of 20 ft. as the least depth at L.W. in the channel of that harbour. Dredging is still proceeding.

350.—India.—*West Coast.—Bombay Harbour.—Third Troopship and Elephanta Rock Buoys Withdrawn.*—With reference to Notice 216, p. 484 :—(1.) Third Troopship buoy, west side of Bombay harbour, has been withdrawn ; (2.) Elephanta rock buoy, southward of Elephanta island, and N.E. side of Bombay harbour, has been withdrawn.

351.—India.—*West Coast.—Narrakel.* — The port-officer at Cochin states that vessels calling at the port of Narrakel will find that (owing to the mud flat having shifted considerably to the southward) the smoothest water is with the following bearing from seaward :—Narrakel flagstaff, N.E. by N. ¼ N. ; Narrakel anchoring buoy, N. by W. ¼ W. ; Mallipurum flagstaff, E.N.E. ; Cochin lighthouse, S.E. ; in from 4 to 5 fathoms of water. Owing to the shifting of the mud bank, the port of Mallipurum is now used for landing and shipping operations, and a new flagstaff has been erected there, which shows above the tops of the cocoanut trees, where signals are attended to from vessels lying in the roads.

Note.—These bearings hold good as long as the mud bank exists so far south.

352.—Bay of Bengal.—*Burma.—Rangoon River and Approaches.—Alterations in the Colour of Buoys.*—In accordance with the uniform system of buoyage, the following alterations in the colour of the buoys from the Fairway buoy off China Bakeer lighthouse, Rangoon river approach, to Rangoon, is being carried out :—The Fairway buoy is painted black and white in horizontal bands. Starboard hand buoys entering the river are painted red ; port hand buoys entering are painted black.

353.—Malacca Strait.—*East Shore.—Penang Harbour. — South Channel.—Light-Vessel withdrawn, and Beacon Light Re-exhibited.*—With reference to Notice 164, p. 382.—The light-vessel which was temporarily moored in the position of No. 4 beacon in south channel, Penang harbour, has been withdrawn ; and the *green* light re-exhibited from the beacon (No. 4).

354.—Borneo.—*N.E. Coast.—Darvel Bay.—North Shore.—Shoal Eastward of Darvel Peninsula.*—Commander A. M. Field, H.M. surveying-vessel *Egeria*, states that this shoal (*Howard shoal*), about 3 cables long, in an E.S.E. and W.N.W. direction, with a least depth of 14 ft. on it at L.W. springs, lies with the west summit of Pulo Gaya bearing S. 13° E., and Shoal point, Darvel peninsula, N. 81° W., distant

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13 miles. Commander Field places Howard shoal in lat. 4° 58′ 15″ N., long. 118° 41′ E., but it has been adapted to the imperfect outline of the surrounding objects on the charts, and placed in approximately lat. 4° 54′ 30″ N., long. 118° 40′ 30″ E. *Variation*, 2° *E.*

355. — SULU OR MINDORO SEA. — *Pálawan Island. — S.E. Coast.— Dangerous Shoal Eastward of Ursula Island.*—In February, 1892, the British barque *Argyll* was totally wrecked on this shoal. The position of the shoal (*Argyll shoal*), as determined by the commander of the Spanish gun-vessel *Mariveles*, is with Ursula island bearing N. 72° W., distant about 5 miles, or in approximately lat. 8° 18½′ N., long. 117° 35′ E.

Note.—As this part of the Sulu sea is imperfectly surveyed, and many uncharted dangers may exist, mariners should navigate in the locality with caution. *Variation*, 2° *E.*

356.—CHINA SEA.—*Shoal Spots on Macclesfield Bank.*—Examination by commander W. U. Moore, H.M. surveying-vessel *Penguin*, of the western rim of Macclesfield bank, has disclosed many spots shoaler than heretofore charted. The general result of the survey, which embraced 95 miles of the western rim of the bank, shows that the average breadth of the rim is about 3 miles, and that the depths over it are 6 to 33 fathoms. In the lagoon itself, the shoalest head, 5 fathoms, was found. Until publication of the full survey, the following spots should be noted:—(1.) *Cathay shoal*, reported by the P. and O. Company's steamer *Cathay*, is 9 cables in length, in a north and south direction, and 8 cables wide. On the shallowest part, in the centre, not less than 7 fathoms could be found. This shoal cast is in lat. 15° 54′ N., long. 113° 58¼′ E. (2.) *Walker shoal*, situated in the lagoon of the Atoll, is circular in shape, and three-quarters of a-mile in diameter. The shoalest spot, 5 fathoms, in the centre, is in lat. 15° 55′ N., long. 114° 28¼′ E. The general depths over this shoal are 7 to 8 fathoms. (3.) *Oliver shoal*, in lat. 16° 4¼′ N., long. 114° 29¼′ E., was not examined in detail, but a depth of 6 fathoms was obtained on it. Shoaler water probably exists in the locality.

Note.—Attention is called to Notice to Mariners, No. 560, of 1891, in which vessels are cautioned not to cross Macclesfield bank, but to navigate "between Macclesfield bank and Bombay reef."

357.—CHINA.—*S.E. Coast.—Kaipong Islands.—Hong Kong Approach. —Gap Rock.—Amended Character of Light.*—With reference to Notice 168, p. 383.—This is a *Fl. white* light (not *intermittent*, as previously given), showing a *flash* of about *five seconds'* duration *every thirty seconds*, elevated 140 ft. above H.W., and visible 18 miles. Ill. app. dioptric of 1st order. Lighthouse and buildings (one block) painted white. Tower 6 ft. above the eastern end of the building. Approx. position, lat. 21° 48′ 50″ N., long. 113° 56′ 20″ E.

358.—JAPAN. — *Inland Sea. — Misima Nada. — Shoal near Track Recommended.*—Commander of the U.S.S. *Alert* reports that when

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following the "Track through" Misima Nada (as shown on Admiralty chart, No. 83), a sounding of 7 fathoms was obtained near where 25 fathoms or more has heretofore been charted, with the south end of Koai sima bearing W. $\frac{7}{8}$ S., and the S.W. point of Itsuki sima N. by W. $\frac{1}{4}$ W., distant $3\frac{1}{10}$th miles. The ship's course was then altered to N. by W. $\frac{1}{2}$ W., and for a distance of about 8 cables, depths of 7 fathoms were found, the water then deepening to 15 fathoms. Approx. position of south end of shoal, lat. 34° 8′ 55″ N., long. 132° 48′ 20″ E.

Note.—As less water may exist on this shoal than above given, mariners should use caution when navigating in the vicinity. The "Track through" on chart, No. 83, has been expunged north-eastward of lat. 34° 1¼′ N. *Variation*, 4° *W.*

359.—JAPAN.—*Yezo Island.—Hakodate Harbour.—Fog-Signal near Kattoji Saki Lighthouse.*—Established in a quadrangular white tower, 27 ft. high, situated close westward of Kattoji saki (Mussel point) lighthouse, west side of entrance to Hakodate harbour. The fog-signal is a bell sounded *six times every minute*. Approx. position, lat. 41° 44¼′ N., long. 140° 36′ E.

360.—AUSTRALIA.—*East Coast.—Keppel Bay.—Little Sea Hill Lighthouse.—Additional Sector of Red Light.*—An additional sector of *red* light is shown between the bearings of S. 6° W. and S. 25° W. from Little Sea Hill lighthouse, south shore of Keppel bay. Approx. position, lat. 23° 30′ S., long. 151° 0′ E. *Variation*, 8° *E.*

Note.—Should Balaclava island leading lights be obscured, a vessel approaching from the northward should keep on the western edge of the above-mentioned *red* sector until cape Capricorn lights are in line bearing S. 70° E.; or, if approaching from the eastward, should keep outside the line of cape Capricorn lights until on the western edge of the sector (as above), thence a S. by W. ¼ W. course should be steered through the sector of *white* light, and when cape Capricorn light is obscured by the high land of cape Keppel, the vessel will be southward of Timandra bank, and may anchor or proceed as advisable.

361.—AUSTRALIA.—*East Coast.—Moreton Bay.—Howe or North Channel.—East Bank.—Extension Westward.*—A narrow sand spit has grown from East bank into Howe or North channel, extending 150 ft. westward of the direction of Tangaluma and Cowan Cowan point lights in line. Approx. position of west end of bank, lat. 26° 59′ S., long. 153° 21¼′ E.

Note.—Mariners should keep Tangaluma light open westward of Cowan Cowan point light, a distance not less than the difference of their heights, at night; and keep Comboyuro lighthouse in line with a small peak showing over the lowest part of the dip in the hills just eastward of Round hill, near Cowan Cowan point, by day—when passing westward of East bank.

362.—AUSTRALIA.—*South Coast.—Encounter Bay.—Port Victor.—Light on Granite Island.*—Exhibited on the east end of Granite island,

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south side of entrance to port Victor. It is a *F. white* light, visible through an arc of 152°, or from the bearing of N. 31° E. (leading eastward of West island), through west, to S. 59° W. (leading southward of Pullens island), and seen 10 miles. Approx. position, lat. 35° 34′ 35″ S., long. 138° 38′ 5″ E. *Variation*, 6° *E.*

363.—Bering Sea.—*Bering Island.—Nikolski Anchorage.—Two Dangerous Sunken Rocks.*—H.M.S. *Porpoise* reports the existence of the two dangerous sunken rocks lying in the approach to, and near the anchorage ground, Nikolski anchorage, west coast of Bering island:—(1.) A rock, with 12 ft. or less on it at L.W., lies in the approach to Nikolski anchorage from the southward, with the south extreme of Vkhodni point bearing (approximately) E.N.E., distant about 9 cables. Position to be considered doubtful, lat. 55° 10½′ N., long. 165° 52½′ E. *Variation*, 4° *E.* (2.) A rock, with 3 fathoms on it at L.W., lies near the anchorage ground in Nikolski anchorage, with Nikolski belfry bearing S. 80° E., distant 5¼ cables, and the north extreme of Vkhodni point S. 40° W. The position of this rock is also to be considered doubtful. The following cautionary note has been placed on the chart of Komandorski islands:—"The detail of the coasts of Bering and Medni islands, and the relative positions of the off-lying islets, can only be considered as approximate. This chart must therefore be used with great caution."

364.—North America.—*West Coast.—Queen Charlotte Islands.—Houston Stewart Channel.—Dangerous Rocks in Fairway.*—Captain E. Rooke, H.M.S. *Champion*, reports the existence of the undermentioned dangerous sunken rocks lying nearly midway between Ross and Ellen islands, in the fairway of Houston Stewart channel:—These rocks (*Quadra rocks*), on which the Dominion Government steam-vessel *Quadra*, struck, consists of a patch 120 yards long in a N.N.E. and S.S.W. direction, and 60 yards wide, the two shoalest spots being at either extreme with 6 ft. water on them, 12 to 14 ft. in other places, and 5 to 6 fathoms around. The patch can be seen at H.W., and is marked at times during slack water by kelp; with the tidal stream running, it is distinguished by overfalls and tide rips. The spring rise was observed to be 16 ft. The west extreme of Quadra rocks lies with Hornby point bearing S. ¼ E., distant 5¼ cables, and south extreme of Ross island W. by S. ½ S. Approx. position, lat. 52° 8¾′ N., long. 131° 6½′ W. *Variation*, 26° *E.* Depths given are at L.W. springs.

365.—United States.—*Maryland.—Chesapeake Bay.—Intended F. Light and Fog-Signal on Shark Fin Shoal, also Discontinuance of Clay Island Light.*—On 1st August, 1892, to be exhibited from a lighthouse erected in about 9 ft. at L.W. on Shark Fin shoal, east shore of Chesapeake bay. It will be a *F. white* light of 4th order, showing a sector of *F. red* light over the S.W. part of Shark Fin shoal from the bearing of N. ¼ E., through

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N.E., to E. ¼ S. The north limit of this red sector will intersect with the S.W. edge of the red sector of Hooper strait light near Bishop head shoal buoy (black, No. 1). Elevated 44 ft. above H.W., and the white light should be visible in clear weather from a distance of 12 miles. Lighthouse, an iron-screw pile foundation, painted brown, surmounted by a white hexagonal frame dwelling, with black lantern. Approx. position, lat. 38° 12′ 5″ N., long. 75° 58′ 50″ W. Also, a fog-signal will be established at Shark Fin shoal lighthouse. A bell struck by machinery, which will be sounded *twice* (double blow) *every fifteen seconds*. On the same date Clay island light will be discontinued. Approx. position, lat. 38° 13¾′ N., long. 75° 58¼′ W. *Variation*, 5° *W*.

366.—United States.—*New York.—Long Island Sound.—Execution Rocks Light.—Amended Alteration in Character.*—With reference to Notice 317, p. 674:—This is a *Fl. white* light *every ten seconds*, showing a sector of *Fl. red* light through an arc of 37°, or from the bearing of N.E. ¼ N. to E. by N. (the former sector of *F. red* light). Approx. position, lat. 40° 52½′ N., long 73° 44′ W. *Variation*, 8° *W*.

367.—Nova Scotia.—*S.E. Coast.—Halifax Harbour Entrance.—Shoal Depths on Portuguese and Rock Head Shoals.*—(1.) A depth of 5¼ fathoms on the S.W. part of Portuguese shoal, lies where 6 fathoms has heretofore been charted, with Chebucto head lighthouse bearing S.W. ⅛ W., distant 2$_{10}^{3}$ths miles, and Camperdown flagstaff W. ⅝ S. Approx. position, lat. 44° 32′ N., long. 63° 29′ 40″ W. (2.) A depth of 3½ fathoms on the north part of Rock Head shoal, lies where 4⅛ fathoms has heretofore been charted, with Camperdown flagstaff bearing W. by S. ¼ S., distant nearly 3 miles, and the west extreme of Thrumcap N. ¼ W. Approx. position, lat. 44° 32′ 55″ N., long. 63° 28′ 50″ W.

Caution. — The position of the buoys in Halifax harbour, and approach, are not to be relied on. The depths given are at L.W. springs. *Variation*, 22° *W*.

368.—Newfoundland.—*South Coast.—Miquelon Islands.—Dangerous Shoal Eastward of Seal Rocks.*—This is a dangerous shoal, with 2 fathoms water on it, lying westward of Great Miquelon island, with Seal rocks bearing S. 74° W., distant about 2 miles. Approx. position, lat. 47° 3′ 20″ N., long. 56° 29′ W. *Variation*, 29° *W*.

Note.—Mariners are recommended not to use the channel between Seal rocks and Great Miquelon island, until further examination of the locality has been made.

369.—Newfoundland.—*South Coast.—Particulars of a Bank S.W. of Cape Race.*—With reference to notice in 1891:—The bank, named *Nickerson bank*, after the fisherman who originally reported it, consists of a rocky patch, extending within the 20 fathoms limit 500 yards in a N.W. and S.E. direction, with a width of 250 yards. On it are two heads of 10½ and 12 fathoms, the former lying near the N.W. end of the bank, the latter 150 yards to the S.E., with 13 and 14 fathoms between. The bank is fairly steep to. A careful

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search failed to find less water than the 10¼ fathoms above-mentioned. This spot, on which the sea probably breaks in heavy weather, lies with cape Race lighthouse bearing E.N.E., distant 17$\frac{5}{10}$ths miles, and cape Pine lighthouse N. ½ W. No tide rip was noticed, but with a long swell from the westward there was a decided lift over the shoalest part. Approx. position, lat. 46° 25′ 40″ N., long. 53° 20′ 35″ W. *Variation*, 29° *W.*

Note.—Mr. Nickerson further states that there are other patches ("one or more") of 11 and 12 fathoms between Nickerson bank and Lamb rock (about 28 miles to the westward), also that there is a patch of 12 fathoms lying with cape Pine lighthouse bearing N.W., distant about 9¾ miles.

OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
30th June, 1892.

THE following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

NOTE.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
1513	Greece: Athens to the Isthmus of Corinth, including Salamis, Eleusis, Magara and Kekhries Bays, and the Northern portion of the Island of Ægina	New Chart. June.
2765	Syria: Ruad Island anchorage ..	New Chart. June.
253A	Africa, E.: Jebel Jan to Seyára	New plan Jibuti Bay, Jebel Jan to Ras Duan, and Southern Coast of Gulf of Tajura. June.
825	Bay of Bengal: Andaman Islands	Plan Table Island and Marshall Channel, and Coco Islands. May.
2761	Sumatra, W.: Sheet II., Tyingkokh Bay to the Strait of Sunda ..	Strait of Sunda. May.
1937	Australia, E.: Adolphus Channel with Albany Pass	New Chart. June.
1663	Newfoundland: Anchorages on W. Coast, Bonne Bay and Head Harbour or Pic à Denis ..	New Chart. June.
1677	Newfoundland, W.: St. Margaret Bay and Castors Harbour ..	New Chart. June.
2040	England, S.: The Solent, Hurst Point to Cowes and Southampton Water	Continuation of Southampton Water. June.
1864	Scotland, W.: Campbelton Loch	New Chart. June.
2669B	France, N.: Sheet IX., including the Southern portion of the Channel Islands	Minquiers. July.

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Chart No.	Title of Chart.	Nature and Subject of Correction.
2711	Adriatic, E.: Sheet II., Gulf of Quarnero, Cape Promontore to Grossa Island	Correction throughout. June.
1003	Africa, E.: River Pungue ..	Correction throughout. June.
830	Bay of Bengal, E.: Bassein River to Pulo Penang, including the Andaman Islands, &c.	Andaman Islands. June.
935	Eastern Archipelago: Harbours and anchorages between Bali and Timor	Plans, Labuan Tering Bay, Lombok Strait and Kulewatte Bay, Damma Island. May.
775	China Sea: Tong King Gulf Approaches to Haifong	New Chart. June.
943	Philippine Islands	Sulu Archipelago. June.
1558	Korea, S.: Crichton Harbour ..	Monacacy Bay. April.
1171A	Australia: Victoria, Port Phillip, Southern Sheet	Corrections in channels. June.
2747A	Australia: Victoria, Entrance to Port Phillip	Corrections in channels. June.
2731	Australia: Victoria, Port Phillip, Geelong Bay	Corrections in channels. June.
2431	America, N.W.: Port Simpson to Cross Sound, including the Koloschensk Archipelago ..	Large corrections. June.
1300	S. America, W.: Plans on the Coast of Chile	New Chart. July.
2853	Gulf of Mexico: Mississippi Sound and Mobile Bay	Mississippi to Chandeleur Sound Railway, and corrections in Biloxi plan. June.
2897	Gulf of Mexico: Florida, Tampa Bay..	St. Joseph Sound to Pass à Grille. May.
712	Newfoundland, W.: Cow Head Harbour	White Rock Bay to Cow Head Harbour. June.
302	Newfoundland, S.W.: Couteau Bay to Cape Anguille	Otter Bay to Rose Blanche. June.
1631	Labrador Harbour: Blanc Sablon and Forteau Bay	Blanc Sablon. June.
2598	Curves of equal magnetic variation, 1895	New Chart. May.

Agent for the sale of Admiralty Charts, Mr. J. D. Potter, 31, *Poultry, London, E.C.*

Official Return of British Wrecks in June, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of June, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	87	 10,490	 94
Steam	9	 7,658	 1
Total	46	 18,148	 95

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports received in June relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—George J. Swanston, Assistant-Secretary, Marine Department, Board of Trade, 2nd July, 1892.

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(Copy.)

H.M. Consulate-General, Hamburg, July 2nd, 1892.

My Lord,—With reference to my despatch to your Lordship, No. 20, of the 2nd ultimo, relating to submarine mines practice, I have now the honour to report to your Lordship that according to a notification of the local authorities of Cuxhaven, dated the 30th ultimo, the operations as reported to your Lordship in my despatch have been abandoned.

Instead, practice with torpedo batteries will take place in the Elbe between Cuxhaven and Kugelbeacon from the 4th instant to about the middle of August.

To warn vessels from approaching the area of operations a guard-boat, distinguishable by four small loading-masts and one large signal-mast, will be moored close to the torpedo ground. Vessels passing are enjoined to give the torpedo ground a wide berth, and under all circumstances to keep to the eastward of it, while anchoring within its limits is strictly prohibited.

At night time the guard-boat will exhibit four fixed vertical lights.

Small steam-launches, carrying crews belonging to the Imperial Navy, will cruise up and down, and vessels approaching or passing the torpedo ground will have to obey orders or directions given by the officers in command of these steam-launches or of the guard-boat, under a penalty of sixty marks fine, or fourteen days' imprisonment.

I have, etc.,

(Signed) Chas. S. Dundas.

The Right Honourable the Marquis of Salisbury,
K.G., &c., &c.,
Her Majesty's Principal Secretary of State
for Foreign Affairs, London.

Official Inquiries at Home, 1892.

4583. *Earl of Aberdeen*, ship; built at Glasgow, 1886; owned by Earl Sailing Line, Limited; tonnage, 2,124; Barry to Monte Video; coal; stranded on the Barrels Reef, Pembrokeshire, May 15, 1892, when sixteen lives were lost. Inquiry held at London, June 16, 1892, before Marsham, Judge; Knox, Ward and Ronaldson, N.A. Stranding owing to vessel having been kept too long on port tack. Certificate of master, who was absent from deck, and did not leave sufficient instructions, suspended for nine months; and that of mate, who was not justified in continuing course when St. Ann's Head Light bore E.N.E., suspended for three months.

4585. *County of Salop*, s.s.; built at Barrow, 1884; owned by County of Salop Steamship Company; tonnage, 1,384; Havre to Swansea; 40 tons ballast in addition to that in her tanks; stranded in

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Widemouth Bay, March 10, 1892. Inquiry held at Liverpool, June 17, 1892, before Stewart, Judge; Anderson, Davies and Phillips, N.A. Casualty due to failure of action of centrifugal pump causing engines to stop, and to master, who was under the influence of drink, neglecting his duty at a critical period. Certificate suspended for twelve months. Owner ordered to pay £200 towards costs for not having seen that effectual measures were taken to remedy defects in centrifugal pumping arrangements, and for not having ordered more ballast in view of previous reports as to behaviour of vessel.

4536. *Eva*, s.s., and *Minnie*, s.s.; former built at Sunderland, 1889; owned by Mr. C. F. H. Leslie and others; tonnage, 820; Tyne Dock to London; coal; latter built at Middlesbrough, 1875; owned by Minnie Steamship Company, Limited; tonnage, 823; Erith to Middlesbrough; ballast; in collision off Spurn when both vessels were damaged and one life was lost, February 23, 1892. Inquiry held at Middlesbrough, June 25, 1892, before Coleman, Judge; Knox, Castle and Brooks, N.A. Collision due to a sudden fog, and to *Minnie* not having reduced her speed, and also to her having starboarded when meeting a vessel nearly end on. Officer in charge uncertificated. Master of *Minnie* failed to give name of his vessel to the *Eva*.

4537. *Harley*, s.s.; built at Port Glasgow, 1880; owned by Messrs. Dansey and Robinson; tonnage, 281; Looe to Neath; ballast; struck the Runnelstone, Cornwall, and foundered, May 27, 1892. Inquiry held at Westminster, June 25, 1892, before Marsham, Judge; Ward and Ronaldson, N.A. Casualty due to master neglecting to ascertain position of vessel on passing the Lizard, and thereafter. Certificate suspended for six months.

4544. *Airlie*, ship; built at Linthouse, 1875; owned by Mr. D. Bruce and others; tonnage, 1,499; Calcutta to Dundee; jute; in collision with a vessel supposed to be the *Alfred and Louisa*, of Woodbridge, off Smith's Knoll Light, May 17, 1892, when latter sank with all hands. Inquiry held at Lowestoft, June 24, 1892, before Reeve and Adams, Justices; Kiddle, Cosens and Cuninghame, N.A. Collision owing to the light of vessel sunk not being seen in time to avoid collision, and to the fact that the look-out could not be understood when he made a report. The Justices suspended the certificate of master for three months for allowing an unsuitable man to be the look-out, and for taking no steps to get a boat ready for lowering; but the Assessors did not concur in the suspension. Ten of the A.B.'s were foreigners.

4545. *Craiglands*, s.s.; built at West Hartlepool, 1883; owned by Mr. R. Hardy and others; tonnage, 851; London to South Shields; ballast; stranded near Marsden Rock, Durham, June 10, 1892. Inquiry held at South Shields, June 30, 1892, before Robson and Wilson, Justices; Davies and Hore, N.A. Stranding owing to master heading westward in a dense fog after sighting Souter Light without having verified his true position, and to his disregarding the warnings of

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the lead. Certificate suspended for two months; recommended for one as mate.

INQUIRY BY INSPECTOR, 1892.

51. *Hartville*, s.s.; owned by Messrs. MacLean, Doughty and Co.; Penarth to Port Said; coal; explosion in stoke-hole, 400 miles W. of Port Said, January 23, 1892, when one life was lost. Inquiry held before Richardson, Inspector, June 7, 1892. Explosion owing to leaks from the boiler causing a body of salt to form with an upper crust under which steam was generated and burst the crust.

OFFICIAL INQUIRIES ABROAD, 1892.

4532. *Garonne*, s.s.; struck Scala Reef, Cephalonia, May 28, 1892. Inquiry held at Malta, June 7, 1892. Casualty owing to a buoy marked on chart not having existed since January, 1891.

4534. *Henry Anning*, s.s., and H.M.S. *Edinburgh*; in collision in Vourlah Bay, May 27, 1892, when former was beached. Inquiry held at Smyrna, June 2, 1892. Casualty owing to mate of *Henry Anning* miscalculating his distance and speed when taking up his berth alongside H.M.S. *Edinburgh* to discharge coal. Certificate as master cancelled; recommended for one as mate. Master censured for his absence from ship.

4538. *Bengal*, ship; stranded on Palmyras Shoal, March 23, 1892. Inquiry held at Calcutta, May 2, 1892. Casualty owing to neglect of lead, to master mistaking Shortt's Island Light, which was not marked on his chart, for the Ridge Light, although of a different character; and to his mistaking a flare-up light seen two miles west of the light for the pilot brig, although the pilot station is shown 30 miles to the E., and the brig has a fixed light besides the flare-up. Certificate suspended for twelve months.

4539. *Enterprise*, ketch; foundered off Althorpe Islands, March 6, 1892. Inquiry held at Port Adelaide, March 15, 1892. Loss owing to vessel springing a leak for which no cause could be given.

4540. *Federal*, s.s., and *Strathearn*, barque; in collision in the Horse Shoe, where latter was moored, March 24, 1892. Inquiry held at Newcastle, N.S.W., April, 5, 1892. Casualty owing to master of *Federal* leaving Stockton wharf before high water slack.

4541. *Theophane*, ship; stranded off Marum Island, Spencer Gulf, August 1, 1891. Inquiry held at Port Adelaide, September 17, 1891. Casualty owing to master navigating among the Sir Joseph Banks Group when the whole gulf was open to him.

4542. *Theophane*, ship; not heard of since sailing from Newcastle, N.S.W., for Mollendo with coal, December 11, 1891. Inquiry held at Newcastle, May 4, 1892. Vessel seaworthy on sailing.

4543. *Warrior*, schooner; stranded at Monte Video. Inquiry held at Monte Video, May 27, 1892. Vessel which was at anchor, drove ashore during a hurricane.

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NOTES.

In a recent number *Le Yacht* gives an engraving of *La Coupe de France*, which was presented by Baron Arthur de Rothschild to the Comité du Yacht Français. M. Richard, the owner of the 20-ton cutter, *Luciole*, the winner of the race held at Brest in September last, at present holds the cup. No challenge having been received from any foreign yacht this year, the cup will remain in its present hands, but it is to be hoped that next year there will be a contest for it. The cup, which is massive, and is a beautiful work of art, cost 6,000 francs.

The American *Railroad and Engineering Journal* describes a submarine boat which has been recently built and tried at Detroit, U.S. She has been built of wood, the transverse sections, which are elliptical, being formed by oak planks cut to the form and bolted together. On these is placed canvas and then longitudinal planks. The driving power is in duplicate, an electric plant and a steam plant, the former for running under water and the latter for surface propulsion, the steam plant being so arranged that it can be used for generating electricity for charging the storage batteries. The boat can thus act independently of a shore station. She is 40 ft. long, and has a total displacement of 75 tons.

The chief novelty, however, is the system of propulsion, which is by side propeller wheels, of which there are two, each twenty-four inches in diameter, and connected with one shaft amidships. To the ends of the shaft are attached gear wheels, working in the gear attached to the propellers, which are turned in any direction by means of a sleeve around the shaft. This sleeve is connected to a hand-wheel with chain belting, and, by means of the hand-wheel, the propellers may be placed in any position. The propellers are protected by brackets from coming in contact with any obstruction.

The boat, when running at the surface, shows about two feet of side, and the conning tower, which also serves for an entrance, is amidships. When her crew of two men have entered the vessel, and she is closed up, water is admitted to sink her, so that only the conning tower is above water. To sink her, the wheels are turned perpendicular, and the machinery set in motion. When the desired depth is attained,

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then the propeller wheels are turned at an angle of about 45°, and the boat is propelled forwards, neither sinking nor rising. To ascend, it is only necessary to stop the machinery, and thus any accident to the machinery would only cause the boat to rise. There is no special provision for a supply of air, the interior of the hull contains 1,500 cubic feet, which is considered to be a sufficient supply for the two men for eighteen hours. The boat has been successfully tried several times on the Detroit River.

FRENCH shipowners are still in a condition of uncertainty as to the bounty system. The Commission to which the matter was referred has made its recommendations, but they have not yet been considered in detail by the Chambers. Meanwhile the existing law is again provisionally extended, the result being great stagnation and uncertainty in shipping matters, a condition of things which if further prolonged will be very serious for French mercantile interests.

STRANGE to say the report of the Commission begins by setting forth the evil results of the bounty law of 1881, as regards premiums for construction, which have, however, averaged two million seven hundred thousand francs per annum. As regards navigation, the results are considered more satisfactory, and the mean annual expenditure under this head has amounted to nearly seven millions and a-half of francs.

STATISTICS collected by the British Consul at Bordeaux bring out very forcibly the failure of the bounty system as regards that port. Out of 107 steamers registered at Bordeaux, 104 were built in the United Kingdom, and also 32 out of the 73 sailing-vessels registered, only one ship registered at Bordeaux has been built in that port since 1881, the year when the bounties began. The French shipping returns last year state that of the total number of ships entering all the French ports only about 35 per cent. carried the French flag.

THE Commission on French shipping propose to decrease the premiums for navigation by about thirteen per cent., in order that the premiums for construction may be increased. It is proposed to raise the premiums for the construction of iron and steel ships to double the present amount, to make a similar increase as regards large ships built of wood, and an even

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greater proportionate increase in the case of small wooden vessels. The premiums for boilers and machinery are also to be increased.

It was intended to hold the summer meetings of the Institution of Naval Architects at Cardiff, but it was ascertained that, in consequence of the general election, the attendance would be very small, and it is now announced that there will be no summer meeting this year, but that next year the meeting will be held at Cardiff.

The precautions taken by the authorities at Charleston have, during the past year, had the effect of diminishing the evil reputation of that port as regards cotton fires. The only important fire in the port was that on board the British steamer *Yesso*, loaded with 5,125 bales of cotton. To this should, however, be added the case of the steamer *Wastwater*, on board of which a fire developed during the voyage, the cotton in her hold being on fire when she arrived at Liverpool.

Two items of interest concerning the progressive influence at work at Dover and Calais are worth recording. The new harbour works at Dover are commenced, the conditions under which the contract for £400,000 was recently accepted being that the work should commence within 14 days. The construction of the eastern arm is expected to take six years, during which it is estimated that £20,000 a year will be spent on labour alone, as all the concrete blocks will be made at Dover. After the construction of the eastern arm, a breakwater will be built, and the harbour will then accommodate the largest liners afloat.

A correspondent of the *Times*, writing from Calais, draws attention to their "Great deep-sea docks, opened for traffic early last year, with a sea approach 10 ft. deeper than that into any other port in north-west France, and 75 ft. entrance wider than Dunkirk. Steamships are frequently delayed at neighbouring ports for want of room or water, yet the Carnot Docks, of Calais, with less charges all round and quicker despatch, are to an extent neglected for want of publicity. In France the Chambers of Commerce are statutory bodies, and the Calais Chamber possesses the entire control of the docks and quays, which it has itself equipped with the most modern appliances."

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THE

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NAVAL PROGRESS.

(SECOND ARTICLE.)

THE cause of the failure of many Navy boilers to do the work they were designed for, is a subject which would occupy too much space in this journal to discuss adequately. It is one, moreover, which is being investigated by a Committee of leading Naval and Mercantile Marine Engineers, and hence it would do little good to enlarge upon it unduly. There are, however, certain features which differentiate naval from mercantile boilers, and it is undoubtedly the differences in design and in the methods of working that are responsible for much of the trouble. In the Mercantile Marine we find two well-known types of boiler—the single-ended and the double-ended. We are excluding vertical donkey-boilers. In the former we have three or four furnaces —usually, three—and each furnace has its own separate combustion chamber. In the latter we have six or eight furnaces, with three or two combustion chambers; that is, each pair of opposite, or each pair of opposite and adjacent, furnaces has a common combustion chamber. The boilers in the Mercantile Marine are constructed to a very rigid and close specification, and but little room is left to the designer for departures. He certainly may vary the general features and proportion; but as regards scantlings, quality of metal, riveting, staying, test and working pressures, &c., he is bound by the despotism of the Board of Trade and of Lloyd's.

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The regulations of these two bodies differ in detail, but they are alike in this, that they involve the use of a very high factor of safety. With the best material and workmanship this factor is never less than five. That Mercantile Marine boilers are safe and reliable is the general experience. That they are too heavy, and much stronger than is necessary is the opinion of the newer school of engineers, who have put great pressure upon Lloyd's and the Board of Trade to induce a relaxation of their Rules. In the Navy we find a wholly different system. The object here is to obtain, not the heavy Flemish dray-horse, but the nervous and fleet racer, which may amble along comfortably for prolonged periods, and then at short notice may be capable of sustained exertion at its maximum power. Unfortunately, the conception of such a boiler has not been at all satisfactory. The material employed is of course of the very best; but in the thickness of plating, strength of riveted joints, test and working pressures, a factor of safety of about 2·5 is employed. Single-ended boilers are not very much used in the Navy, and since they were fitted in the *Conqueror* we do not think there are any other examples of their use. The first-class battle-ship, *Ramillies*, has, however, a set of eight single-ended boilers. Double-ended boilers have been mostly used, as such a boiler is lighter and cheaper and slightly superior in evaporative efficiency to two single-ended ones. In Navy boilers we find the tubes spaced much closer than is the practice in the Merchant Service. Of late the designs of Navy boilers have tended to approximate to those in the sister Service. Thus, instead of building double-ended boilers with a common combustion chamber for all furnaces, separate combustion chambers, common to only a pair of furnaces, are built. The *Vulcan*, which has been such a lamentable failure, only so far, however, as her boilers are concerned, is fitted with four double-ended boilers of the ordinary return tube type. There are six furnaces in each boiler, all leading to the common combustion chamber. The total heating surface is 17,488 square feet. There is also an auxiliary boiler. Owing to the excessive leakage from the tube plates, when using forced draught, the expected speed could not be obtained. Another type of boiler which is very exclusively employed for the smaller vessels of the Service is the locomotive boiler. This boiler, as its name implies, is really a modified form of that boiler which is universally employed on railways. There is, however, this difference, that whereas the shore locomotive works with *induced* draught, created by the exhaust nozzle in

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the base of the funnel, the marine locomotive boiler works with *forced* draught, *i.e.*, the excess of air is forced into the furnaces, and the exhaust steam from the engines is of course condensed and returned as feed. On the whole, this type of boiler has given great satisfaction, as it is, for the heating surface it contains, the lightest boiler to use. When pressed to its utmost power the tube ends usually leak. These, then, are the principal differences between the boilers of the two services. As to the cause of the leaky tubes which so far seems to be the chronic malady which afflicts Navy boilers, the subject is one upon which we do not now desire to express any opinion. The physical and chemical actions which take place within a marine boiler are but partially known even by the most expert. We know the temperature of steam at any given pressure, but as for the temperature of the gases as they issue from the combustion chamber to the tubes the most vague ideas prevail. In fact we do not know it. It is however certain, that if mercantile boilers were habitually pressed under forced draught they would stand it better than Navy boilers, because they are, if one may say so, of a more robust constitution. Another conclusion is that better results are obtained by using separate combustion chambers; and lastly, the more perfect is the combustion the more intense the heat, and the greater the tendency to distortion and expansion of the tube plate. Many experiments have been tried, but without much success. That of protecting the tube ends seems to be the most promising. Wrought-iron ferrules, shaped not unlike the end of a trumpet, are placed in the tubes, the turned back portion covering the tube end and protecting it from the intense heat. This method has been very successful in the *Thunderer*.

As an example of the difference in the two services, we may compare the boilers of H.M.S. *Australia* and *Galatea*, with those of the *Empress of India* and her sisters.

Type of Boiler and Number.	H.M.S. *Galatea* and *Australia*. 4 D.E. R.T.	*Empress of India*. 4 D.E. R.T.
Heating Surface ...	15,000 sq. ft.	20,192 sq. ft.
Grate Area	495 sq. ft.	710 sq. ft.
Pressure per sq. in. ...	136 lbs.	160 lbs.
Total I.H.P.	9,653	9,625
Weight of Boilers (including water and fittings)	430 tons	695 tons

difference :—265 tons.

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The temptation to cut down all weight which does not contribute to the value of the ship as a weapon is very great, and within certain limits is quite proper, as it enables more armour, more guns, and more ammunition to be carried.

We need not discuss the questions of forced draught, as if perfect combustion, and, therefore, if the most economical use of fuel is desired, an excess of oxygen is necessary. Whether this excess should be forced through the fires or "induced" in the chimney is a moot point. We need only remind the harsh critics of the Admiralty that, speaking with full knowledge, the experience in the Merchant Service with modern boilers and forced or assisted draught has not been a happy one; and if we are to condemn the naval engineer advisers of the Admiralty, we shall have to censure many of our leading marine engineers in the Merchant Service. We certainly do not feel called upon to do this. The truth is that marine engineering is, after all, by no means the exact science it is represented to be, or that it will become. It is comforting to reflect that all other navies find the boiler question equally vexatious.

That Board of Admiralty which had the courage to break away from the traditions of the past and to become independent of the War Department in the matter of guns, deserved well of the country. It is to the great credit of the present Board that it has taken the control of naval ordnance upon its own shoulders; and, thanks to the new arrangements, the scandals, for they were nothing less, of ships waiting for guns are not likely to be repeated. The manufacture of ordnance proceeds now concurrently with the building of the ship, and we can now rely upon the armament always being ready as soon as the vessel is ready to receive it. It is also satisfactory to note, that after some 50 years of experiment, we have at length reached some definite conclusions and are approaching finality in gun construction. We have discarded the muzzle loaders, and the famous "Woolwich Infants" of 80 tons are now obsolete. Types of guns all on the breech-loading principle have multiplied, and there are in use in the various navies of the world some 105 distinct types. We employ the Armstrong in its various modifications as our naval gun *par excellence;* but for quick-firing arms, we use the Nordenfeldt, Maxim, Hotchkiss, Gardiner, and Gatling. We have definitely abandoned the very large guns, and it is now a principle that a gun is not admissible on board a warship unless it can be "man handled."

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The 67 ton gun is the favourite for first-class battle-ships, but the 29 ton gun is probably the only large gun which could be rapidly handled in an engagement.

It is probable that the day of heavy guns is passing, and that more attention will be devoted to the quick-firing armament. The wonderful development of this branch of naval ordnance has effected a perfect revolution in naval strategy. Perhaps the 100-pounder 6-in. Armstrong gun is the most interesting example. This marvellous weapon can be fired 12 times a minute, and its projectile can pierce 14·3 inches of iron at short distances, say, up to 1,000 yards. Such a weapon by its rapidity of fire, and, if coolly handled, could put the largest guns in use out of action. Some navies, notably the Italian and Argentine, are building war-vessels of the cruiser class which carry no heavy guns but these terrible 100-pounder quick-firing guns.

Below we give a useful table of the principal particulars of the guns used in the Royal Navy:—

PARTICULARS OF GUNS USED IN THE ROYAL NAVY.

Calibre in Inches.	Weight in Tons.	Muzzle Velocity per sec.	Penetration of steel at 1,000 yds. Inches.	Approximate Cost.	Maximum Cost of One Round, Full Charge and Steel-Armour Piercing Shot.
		BREECH-LOADING.			
16·25	111	2,087	24	£19,000	£164
13·5	67	2,016	21·3	13,000	114
12	45	1,914	15·3	7,000	66
10	29	2,040	15·3	6,000	46
9·2	22	2,036	13·8	5,000	33
8	15	2,150	11·5	3,000	16·5
6	5	1,960	7·8	1,000	10·5
5	2	1,800	5·1	500	—
4	1·3	1,900	4·0	400	—
		MUZZLE-LOADING.			
16	80	1,540	18	10,000	No Steel Armour
12·5	38	1,575	14	3,500	Piercing Shot
10	18	1,379	9	1,500	Provided.
9	12	1,440	7·5	900	,,
8	9	1,390	6	600	,,
		QUICK-FIRING.			
6	7	2,150	9·0	1,600	£12
4·7	41 cwt.	2,100	5·4	650	3
6 pdr.	8 ,,	1,810	2·0	300	—
3 ,,	5 ,,	1,873	1·8	250	—

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As with guns, so with the propelling agents, their name is legion. In Nelson's time a keg of powder was a keg of powder. Now guns require their own special pabulum. We employ some eight varieties of gunpowder, from the fine and coarse grain powder resembling black sand to the prism (P), E. X. E., and S. B. C. varieties. The compositions vary greatly, according to the effect required. The Admiralty has successfully introduced the smokeless powder, or cordite, the invention of Sir F. Abel. Cordite cannot, however, be regarded as a powder; it is really one of the "high explosives," and is composed of nitrated cotton and nitro-glycerine. Glancing at torpedoes. We still retain the Whitehead; but in our hands it has been greatly improved, and we no longer depend upon foreign manufacture for the supply. That a blunder was committed in paying £100,000 for the Brennan torpedo seems apparent. A premium of £10,000 or less would bring scores of inventors to produce any desired machine. Whether the automobile or controlled torpedo is the better, and whether torpedoes will prove dangerous alike to friend and foe in the day of battle are questions that experience alone can decide. We must now briefly glance at some other matters which have occupied the Admiralty.

The Admiralty have had a good many problems of what may be called domestic policy to thrash out, and these are still engaging its attention. As in the Merchant Service, we see the engineering branch claiming more recognition and a greater share of the honours of the service. Much may be said on behalf of the view generally entertained by the "executive" or "deck" department, viz., that the engineer is merely the mechanic who starts and stops the machinery as ordered; also much may be said for the contention of the engineer, that the man who makes it possible for speed to be maintained, and who keeps the whole machine in working, is entitled to the same praise as the commander, who takes her through an engagement, or who makes a successful passage. Without discussing a burning question, we may do some good if we place the matter on the broadest possible basis. Civil engineering is defined as that application of intelligence, whereby the natural forces are subjected to the service of man; an engineer is one who is engaged in the manipulation of engines. This being so, the man who commands a Geordie brig or an ironclad is essentially an engineer, he is daily engaged in the use of those engines, the lead, log, sextant, chronometer, &c. Old salts

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will doubtless scorn the idea of being classed as engineers, while the latter will just as emphatically deny that anyone who has not been through the "shop" can be an engineer. Yet one needs only to consider, and it is at once apparent that the success of any voyage depends upon the way in which the captain uses *his* machines, the sextant, chronometer, &c., and the way in which the marine engineer uses *his* main engines.

Questions of relative rank and precedence of engineers in both services are after all a simple matter, if we recognise that a modern seaman must be an engineer. The corollary is, then, that an engineer is, or should be, eligible to command a ship. Precisely. An engineer? Yes. A mechanic? No. And this is the *crux* of the whole question, so long as marine engineers consider themselves as skilled mechanics they will be treated as such; but when they show less of the "shoppy" element, and more professional tone, they will find their aspirations fulfilled. We see no reason why naval engineers should not be combatant officers. While admitting fully the utter absurdity of the "Lascar and oil-can" theory, marine engineering is not more difficult to master than naval gunnery. If a lieutenant or seaman can learn to efficiently handle a torpedo or submarine mine, he will find the charge of a set of marine engines a good deal less onerous. On the other hand, a properly trained naval engineer (not mechanic) ought to be as well able to *use* naval weapons as to keep them in repair. The best men that can be obtained for the various volunteer corps of submarine miners are fitters and other mechanics. It is absurd, then, to say that an engineer officer cannot become a combatant. And equally absurd to say that a lieutenant who has mastered the complex machinery of a Whitehead could not be trusted to act as an engineer officer. To efficiently sail, handle, or fight a modern vessel, is essentially the application of various branches of engineering knowledge. In the Army we find officers of the Royal Engineers employed in all warlike operations: how, quite recently, a fighting engineer blew up the gates of a mountain fortress in India, is within the recollection of most people.

We say that for both services the present system of segregation between the various branches is a mistake and productive of inefficiency and friction, and also of expense.

Another matter which has engaged the attention of the Admiralty, has been the Royal Naval Reserve. How, for many years, this force was neglected by the naval authorities

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and the shipowners, and how it has been at length recognised and encouraged, is too well known to be dealt upon here. In its present form, it promises in time to become our most valuable volunteer force. It is no exaggeration to say that a naval brigade composed of trained officers and men of the Royal Naval Reserve, *i.e.*, those who have at least 12 months sea training would be more valuable than half a dozen volunteer regiments.

While on the subject of the Royal Naval Reserve, we might remind our many readers who are members of that force, that to those men who perfect themselves in naval studies, *i.e.*, gunnery, engineering, chemistry, construction, &c., and who, if possible, can put in a year at the Royal Naval College, the next war will offer some splendid chances of promotion; and it will certainly be again possible for a smart and energetic young man who has commenced as an apprentice to command a warship with a possibility of Westminster Abbey. While recognising the splendid results achieved by the Admiralty, we by no means approve of the present methods of Naval Administration. The very fact that it was possible to allow our chief and only means of offence and defence to become a rusty machine, and then in an outburst of patriotism to vote millions to place us in a state of security, shows that our Naval Policy and Administration is radically defective. So long as we make the Navy subject to political influences, we must always expect a recurrence of those periods of alternate starvation and spasmodic repletion with which the Navy is only too familiar. Our naval history gives several instances of the evils which have resulted therefrom. The present system makes the efficiency of the Navy entirely dependent upon party exigencies. To ensure a continuity of Naval Policy commensurate with the needs of the Empire a thorough re-organisation of the existing system of naval administration is required. What is now known as the "Board of Admiralty" should become a "general staff"—that is, it should be composed of representative officers of the highest rank from all branches of the service. Its functions should be to act as the eyes and brains of the service. It would comprise, of course, the Naval Intelligence Department. It is not generally known that our Naval Intelligence Department is in numbers less than that found necessary in a fifth-rate South American State. Distinct from and independent of the general staff would be the

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executive and technical branch of the Admiralty. This would be composed of officers of the highest rank who, as combatants, constructors, engineers, and artillerists and chemists, would decide upon questions of design and construction of ships, and guns, equipment, commissariat, &c.; each member of both the general staff and of the technical staff would act upon his professional reputation. At present it is possible for many errors and mistakes to be made at the Admiralty, but impossible to fasten the responsibility upon anyone. Such are some of the changes which, in the opinion of the most thoughtful naval critics, are bound to be made. France and Germany have found such a system as we have sketched a necessity, and these nations have carefully ensured the exclusion of all political influence in the naval and military organisation. In concluding this notice of the work of the late Admiralty, we can only say that whatever may have been the errors in other respects of the late First Lord, he certainly endeavoured to place the defences of the Empire on a firm basis. He was most ably seconded by a body of naval officers who, we may be sure, would skilfully handle the fleets they have created. In Mr. W. H. White, the chief constructor, we have one of the best specimens of trained scientific intelligence. The same remark applies to the late Mr. Sennett, R.N., and the present Mr. Durston, R.N., the engineers-in-chief. In Mr. A. B. Forwood, M.P., we had a trained commercial intellect which supplied the economic stimulus so necessary, and, let us add, so much required. In short, the late naval administration has, on the whole, deserved well of the country.

We earnestly trust that in the new administration no false notions of economy will be allowed to hinder or interfere with the progress of Naval Defence. That the time will assuredly arrive when we shall have to fight for our national existence is certain. In the present state of European politics it would be rash to predict a much longer continuance of a long peace. The jealousy of peoples is more to be feared than the ambition of kings. That many nations are jealous of us is a well-known fact. It behoves us, then, to do all we can to strengthen the hands of those who are entrusted with the work of naval defence, so that when the day of battle comes, as it assuredly will come, it will find us armed and well prepared to defend our glorious British Empire.

GEO. HERBERT LITTLE.

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A NEW VERSION OF AN OLD PROBLEM IN NAVIGATION.

THERE is a problem in Navigation which has been in use for a long time and is known by various names, such as "the method by trial and error, the approximate double altitude, and the double chronometer." It seems to have been first proposed by Lalande, a French astronomer, in 1764. As the method by trial and error it was much used by our fathers between 1780 and 1820. Lynn (1830) gives it. Raper gives it as the approximate double altitude. About 1845, Pagel, a French naval officer, proposed it for latitude and longitude as the double chronometer. Johnson gives a modification of it, and Captain Martin, in his recent work, gives both Pagel's and Johnson's forms of it. Up to Pagel's time it was a latitude problem solely, but since that it has been used to fix the position both in latitude and longitude. It depends on the following fact:—

If two altitudes of the sun or other heavenly body are taken with an interval between them, and if the apparent time is calculated from each altitude, then the interval between these apparent times ought to be the same as the interval shown by the chronometer (corrected for run if necessary), and it *will always be so*, provided the true latitude has been used in calculating the observations. Hence, if the interval (from the chronometer), and the computed interval (from the sights) do not agree, we know the latitude used is not the true one, and we must look *there* for the error and correct it. It follows, too, in these days of accurate chronometers, that if we fix the latitude we can get the longitude also, and so determine the ship's position fully.

The rules for working this problem at present seem to me somewhat clumsy, and likely to frighten off some of our weaker brethren (in mathematics) from what is really a most simple and useful method, one which, moreover, possesses the merit of affording a check on its own errors. It is possible to make the problem "prove," as we used to say at school long ago, and this is surely a great advantage. The rules at present given (Raper, Ed. 1857, p. 247, and Martin, double chronometer chapter) are

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many and complicated. They are founded on the differential equation

$$\frac{\Delta \text{ Hour Angle}}{\Delta \text{ Colatitude}} = -\frac{\text{Cot. Az.}}{\text{Cos. Lat.}}$$

or as it becomes for computation :—

Sin. Diff. Hour Angle = − Sin. 1′, Cot. Az. Sec. Lat. (*a*).

Now since this is a differential equation, the negative sign not only carries its own algebraical power, but also signifies that the hour angle and colatitude vary in contrary directions, *i.e.*, as one increases the other decreases, and *vice versâ*. Hence the complicated system of rules and signs to render easy a bit of the higher mathematics to those unacquainted with them. These rules in Raper take up two pages, and in Martin about a page and a half.

I would therefore propose a new method, which I believe to be simpler and more logical. The chronometer interval corrected (if necessary) for the run, is the true difference of apparent times of sights. Make this, then, the standard of comparison, and if the difference of the computed apparent times does not agree with it, it is clear that there is an error in the latitudes used. To ascertain this, work each sight with a latitude one mile North or South (as you may choose) of the first latitudes used. The difference between these apparent times shows the variation caused by putting the latitude one mile either way, and will also show which way the interval must be corrected. To correct the latitude is then only a proportion sum. The computed interval differs by so much from the true interval, and the effect of one mile North or South in latitude is to alter the computed interval by so much. The one quantity divided by the other gives the miles and fractions of a mile, the latitudes first used were in error. Knowing the true latitudes, the longitudes are found in the usual way. There is in all this no limitation, and no necessity to consider cases, or whether the sun is one side or the other of the prime vertical or meridian. The rule unfolds itself as it goes along. Two quantities ought to be equal, and they are found not to be so. Hence there is a reason, and the reason shows itself on the figures, viz., that the latitude used is too far North or too far South. But the figures also show how much one mile of latitude affects the first-named quantities, and in what direction. The rest is a proportion sum. Can anything be much more simple?

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The method of correcting the time interval for run has not been in use before, and is adopted in order to get a true standard with which to compare the computed quantities. Such a standard is given by the true difference of apparent times, which may be obtained from the chronometer interval corrected for the change of longitude due to the ship's run. If a ship is stationary, the true difference in apparent time between any two observations is the same as the interval of time shown by the chronometer. But in actual practice at sea there will always be a change of position between the sights, and it is a familiar fact to seamen that this change of position causes a gain or a loss of time. Hence the necessity of correcting the chronometer interval for the difference of longitude due to the run. Therefore every care should be taken to estimate the run accurately, as an error here may lead to a large error in the ship's position. It is usual now to steer the ship to the nearest degree, and I would recommend that the log be read as each sight is taken. This can be done with most logs without hauling in. I do not think I need trouble to give the proof of a problem sailors have been using since 1770. Hence I will only give the rules :—

1. At any convenient time take the altitude of any heavenly body, and with the D.R. latitude determine the ship apparent time. Determine also the ship apparent time due to a latitude one mile North or South, as you may think fit.

2. Note very carefully the course and distance run by the ship up to a second convenient time, and find thence the Diff. Lat. and Diff. Long. made good. Turn the Diff. Long. into time, and correct the D.R. latitude to the second convenient time.

3. At the second convenient time take another altitude of the same (or a different) heavenly body, and thence determine the ship apparent time, and also the apparent time due to a latitude one mile North or South, *in the same way as before* under precept 1.

4. Take the difference of the chronometer times of observation, and to it apply the difference of longitude in time, adding if the run was East, subtracting if the run was West. This is the true difference of apparent times, or, as we shall call it, the "true interval."

5. Take the difference of the apparent times given by the D.R. latitude and the latitude obtained from it by applying the correction for run. Take also the difference of the apparent

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times given by the latitudes one mile North or South of the above, as it may have been worked under precepts 1 and 3. These are the computed differences of apparent times, and we shall call them "computed intervals." The difference of these computed intervals is the change in interval due to one mile of latitude North or South, as the case may have been; and it will be seen at once whether this change tend to increase or decrease the interval.

6. To correct the latitude is now a simple proportion sum. If either of the computed intervals agree with the true interval, then that set of latitudes are the correct ones at the first and second observations. If they do not, then decide which of the computed intervals it is desired to correct. That due to the D.R. latitude and the run is usually the more convenient. Take the difference between the true interval and the chosen computed interval. This is the whole quantity to be corrected. Divide it by the change of interval obtained under precept 5. The result is the miles and fractions of a mile the latitudes worked with are in error.

To check the correction, take the difference between the apparent times found at the first observation, note very carefully how it varies. This will be the correction in apparent time due to one mile of latitude. Multiply it by the correction in latitude, and apply with the proper sign. That will give the correct apparent time at the first observation. Repeat the process for the second observation. The interval between these corrected apparent times ought to be the same as the true interval. If it is not, there is something wrong with the work.

Note.—The corrected apparent times are here obtained by proportion. This will not be true, when—

(*a*) There is any great correction in latitude, say over 20′.

(*b*) The difference in apparent time due to one mile of latitude is large, say over 20″, as will be the case near the meridian.

In both these cases the apparent times should be re-calculated with the corrected latitudes, and corrected again, if necessary, till the true and computed intervals correspond. I hope the method will be found serviceable, and I append some examples:—

On the 25th January, 1891, on board R.M.S. *Orizaba*, in lat. 8° 50′ N., the sun's zenith distance (W. of mer.), was 27° 43′, 45″ at 19^h 32′ 33″ G. M. T. The declination was 19° 0′ 30″ S., and the Eq. T. 12′ 30″ + to App. Time.

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With these elements the Apparent Time will be found to be $0^h\ 10'\ 9''$ for Lat. 8° 50′ N., and $0^h\ 10'\ 53''$ for Lat. 8° 51′ N.

The ship then ran S. 75° E. 18′, and a second observation showed the zenith distance to be 34° 41′ 15″ at $20^h\ 52'\ 22''$ G. M. T. The corresponding declination and Eq. T. were 18° 59′ 30″ S. and 12′ 31″ +.

This second observation gives $1^h\ 24'\ 28''$ App. Time with Lat. 8° 45′ 15″ N., and $1^h\ 24'\ 22''$ App. Time with Lat. 8° 46′ 15″ N.

The diff. long in time due to the run will be found to be 1′ 11″, and the run is East.

We have therefore—

$20^h\ 52'\ 22''$ = Latest Chronometer Time.
19 32 33 = First Chronometer Time.

1 19 49 = Chronometer Interval.
1 11 = Correction for run East.

1 21 00 = True Interval.

This true interval is the standard of comparison to which we refer our other times.

We have further

$1^h\ 24'\ 28''$ = Second Apparent Time } Due to Lat. 8° 50′ N.
0 10 9 = First Apparent Time } and the run.

1 14 19 = Computed interval due to D.R. lat.

Also we have

$1^h\ 24'\ 22''$ — Second Apparent Time } Due to Lat. 8° 51′ N.
0 10 53 = First Apparent Time } and the run.

1 13 29 = Computed interval due to a latitude one mile *North* of the D.R. lat.

From this it is quite plain that the interval due either to the D.R. lat., or a latitude one mile *North* of that, is *too small*. Further that putting the latitude to the Northward *decreases* the interval at the rate of $(1^h\ 14'\ 19' - 1^h\ 13'\ 29'') = 50''$ per mile. It is therefore evident that 8° 50′ N. is farther North than the true latitude, which must be put to the Southward.

To ascertain how much we have—

$1^h\ 21'\ 00$ = True Interval.
1 14 19 = Interval due to 8° 50′ N.

6 41
60

401 seconds = Error in Interval.

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Now, since the Interval, as we have seen above, alters 50″ for each mile of latitude, it is plain that a correction of 8′ South will make the latitude right. Hence the true latitude is 8° 50′ N. − 8′ = 8° 42′ N.

To see that this is accurate, we will correct the computed intervals. To do this we have—

10′ 53″ = Apparent Time at 1st obsn. due to 8° 51′ N.
10 9 = Apparent Time at 1st obsn. due to 8° 50′ N.

+ 44 = Diff. due to one mile North.
Hence − 44″ = Diff. due to one mile South.
∴ − 5′ 52″ = Diff. due to eight miles South.
i.e. 10′ 9″ − 5′ 52″ = 4′ 17″ = App. Time due to 8° 42′ N.

Similarly.

1ʰ 24′ 28″ = Apparent Time at 2nd obsn. due to 8° 45′ 15″ N.
1 24 22 = Apparent Time at 2nd obsn. due to 8° 46′ 15″ N.

− 6 = Diff. due to one mile North.
∵ + 6 = Diff. due to one mile South.
∵ + 48 = Diff. due to eight miles South.

Hence 1ʰ 24′ 28″ + 48″ = 1ʰ 25′ 16″ = Apparent Time due to 8° 37′ 15″ N., which is the latitude of the second observation if 8° 42′ N. is the latitude of the first.

Thus for the corrected interval we get—

1ʰ 25′ 16″ = Computed App. Time of 2nd observation.
4 17 = Computed App. Time of 1st observation.

1 20 59 = Interval of Apparent Times, which is only 1″ from the True Interval of 1ʰ 21′ 00″. This verifies the latitude.

To get the longitudes we have—

For 1st Observation.				For 2nd Observation.			
0ʰ	4′	17″	= App. Time.	1ʰ	25′	16″	App. Time.
	12	30	= Eq. T.		12	31	Eq. T.
24	16	47	= S. M. T.	25	37	47	S. M. T.
19	32	33	= G. M. T.	20	52	22	G. M. T.
4	44	14	= Long. E.	4	45	25	= Long. E.
71°	3′	30″	E.	71°	21′	15″	E.

The run gives 17′ 45″ Diff. Long., and so the two longitudes agree.

Also allowing a run of S. 75° E. 1′ from noon to 1st observation, we get for the noon position, deduced from these

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observations, 8° 41′ 45″ N., and 71° 2′ 30″. The noon position by meridian altitude, and A.M. chronometer sights was 8° 42 N., 71° 3′ E.

It will be noticed that this is not what would be generally considered as a favourable case. Both sights are P.M., and the first sight is not five minutes from the meridian. But (and it is one of the advantages of the method) there do not seem to be any limitations to this problem. But where there is a large difference in Apparent Time due to an alteration of one mile in latitude (such as 44″ here), it is not safe to trust to the computation of the Apparent Times by proportion simply. It is better to recalculate them rigidly, and this should also be done if there is a very large correction (over 20 miles) to be made for latitude.

Doing this here, and taking the trouble to work to the nearest second, we find that 8° 42′ 6″ N. is the latitude at the first observation, and that the Apparent Times are 4′ 10″ and 1ʰ 25′ 10·5″. These give the computed interval, 1ʰ 21′ 00·5″, which agrees with the true interval, and they give for longitudes 71° 1′ 45″ E., and 71° 19′ 45″ E. respectively.

On Monday, 28th Dec., 1891, at my house in Hobart, Tasmania, I obtained the following sights. The time was taken by a Waltham pocket watch which was known to keep mean time.

At 7ʰ 23′ 8″ a.m. the zenith distance was 58° 9′ 00″, the declination being 23° 19′ 30″ S.

And at 8ʰ 39′ 48″ the zenith distance was 44° 9′ 45″, the declination being 23° 19′ 15″ S.

I chose to work with Lat. 42 S., as an experiment, though I knew this was more than 50′ out, the true Lat. being 42° 53′ 30″ S.

With Lat. 42 S. the Apparent Times were 19ʰ 30′ 35·1″ for 1st observation, and 20ʰ 46′ 7·5″ for 2nd observation.

With Lat. 41·59 S., the times were 19ʰ 30′ 35·5″ and 20ʰ 46′ 6·6″ respectively.

Hence (as there is no run) we have—

8ʰ 39′ 48″	=	Latest Chronometer Time.
7 23 8	=	First Chronometer Time.
1 16 40	=	True Interval.

Also—

20ʰ 46′ 7·5″	=	Second App. Time due to 42 S. Lat.
19 30 35·1	=	First App. Time due to 42 S. Lat.
1 15 32·4	=	Computed Interval due to 42 S. Lat.

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And—

$20^h\ 46'\ 6{\cdot}6''$ = Second App. Time due to 41·59 S.
$19\ 30\ 35{\cdot}5$ = First App. Time due to 41·59 S.

$1\ 15\ 31{\cdot}1$ = Computed Interval due to 41° 59′ S.

Hence we see—

1st. That the Computed Interval is too small, and must be increased.

2nd. That putting the latitude to the Northward makes it still smaller, and therefore the correction is South.

As to the amount of correction we have—

$1^h\ 15'\ 32{\cdot}4''$ = Computed Interval due to 42 S.
$1\ 15\ 31{\cdot}1$ = Computed Interval due to 41·59 S.

$-1{\cdot}3$ = Correction for One Mile North.

Also we have—

$1^h\ 16'\ 40''$ = True Interval.
$1\ 15\ 32{\cdot}4$ = Computed Interval due to Lat. 42 S.

$1\ 7{\cdot}6$ = Error in Interval.

60

$1{\cdot}3\ )\ 67{\cdot}6\ (\ 52$

65

$2{\cdot}6$
$2{\cdot}6$

Hence there is an error of 52′ in the latitude, to be applied to the Southward.

This will give 42° 52′ S. as the true Lat., and ·4″ − as the correction for one minute of Lat. to be applied to the first sight; and ·9″ + as the correction to be applied to the second.

This gives—

$20^h\ 46'\ 54{\cdot}3''$ As the Computed App. Time at 2nd observation.
$19\ 30\ 14{\cdot}3$ As the Computed App. Time at 1st observation.

$1\ 16\ 40$ Computed Interval.

Which confirms the latitude.

But as a correction of 52′, even near the prime vertical, is a large amount, it will be better to re-work these sights with Lat. 42° 52′ S. If we do so, we shall find the Lat. to be 42° 52′ 30″ S. one mile from the true Lat.

The Long. was not obtained here, as the watch was only a pocket one, and no chronometer was available, but I have no

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doubt these sights would give an excellent Long. if the G. M. T. had been known.

To show the value of close working, I may mention that these sights worked to the nearest second give 42° 53′ 10″ S., which is a little more than a quarter of a mile only from the truth.

The last example I shall give is taken from Captain Martin's recent work on Navigation. I give it to illustrate the difference in the way of working between that given here and that given by Captain Martin or by Pagel, for both methods are found in the book. I do not think it right to ask the Editor for space to give the methods side by side, as any one interested in these matters will most likely have Martin's book at his disposal, so I simply give my own working :—

On 25th April, at 7.30 a.m., lat. D.R. 49° 20′ N., long. D.R. 5° 40′ W., the following observation was taken :—

Chron.—8^h 1′ 50″ ⊙ 24° 49′ 20″. True bearing, S. 82° E. The ship then ran N.E. by E. ½ E. 12′ – variation 22° W., deviation 21° E., till 9.40 a.m., when

Chron.—10^h 10′ 22″ ⊙ 43° 52′ 10″. True bearing S. 51° E.

On 20th April Chronometer was slow on G. M. T. 11^h 51′ 2″, and the rate was 5·6″ losing – I. E., 2′ 10″ + – dip 20ft.

Corrected declination, 1st observation, 13° 21′ 30″ N. Eq. T., 2′ 11″ – from App. Time.

Corrected declination, 2nd observation, 13° 23′ 30″ N. Eq. T., 2′ 12″ – from App. Time.

The first observation worked with 49° 20′ N. and 49° 21° N. gives 19^h 31′ 57·7″, and 19^h 31′ 58·6″ for the Apparent Times.

The run gives 5′ 45″ N. difference latitude, and 16′ E. difference longitude.

The second observation worked with 49° 25′ 45″ N. and 49° 26′ 45″ N. gives 21^h 40′ 56·8″, and 21^h 41′ 1·9″ for the apparent times.

The chronometer times, corrected for error and rate, are :—

For 1st observation, 19^h 53′ 19·9 }
For 2nd observation, 22^h 1′ 51·5″ } Run, 1′ 4″ East.

Hence we have :—

True interval, 2^h 9′ 35·6″.

Computed interval (due to 49° 20′ N.), 2^h 8′ 59·1″.

Computed interval (due to 49° 21′ N.), 2^h 9′ 3·3″.

Hence the computed interval is too small, and must be altered to the Northward, since one mile North in latitude increases it by 4·2″.

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Now, the difference between the true interval and the computed interval due to 49° 20′ N. latitude, is 36·5″, and this divided by 4·2″, gives 8·7′ as the correction for latitude.

Hence the latitude at 1st observation is 49° 28′ 45″ N.

And the latitude at 2nd observation is 49° 34′ 30″ N.

To confirm this, if we make the proportion, we find the interval to be 2ʰ 9′ 35·8″, and if we calculate it rigidly it is 2ʰ 9′ 35·3″.

The corresponding longitudes are 5° 51′ 15″ W., and 5° 35′ 30″ W.

PHILIP R. H. PARKER,
Captain R.N. (Retired).

Hobart, Tasmania, 1892.

WEATHER FORECASTS.

LORD BACON has said that "every wind has its weather," and certainly, judging by the frequent changes which occur in the vicinity of the British Islands, there seems ample justification for the assertion. Yet, in spite of the indisputable privilege of an Englishman to grumble at the weather, a privilege which lapse of time does not seem to lessen, we have in England perhaps about as perfect specimens of the weather as in most other parts of the world.

Our knowledge of the weather has made considerable advance during the last 25 years, and the changes which occur can now be thoroughly understood, whereas only a few years ago, even after the event, the most perfect chaos seemed to exist. The system of weather discussion which has brought about this change is the method of grouping together the observations of wind and barometer over a somewhat extended area instead of dealing only with isolated observations. In this way it is possible to see the connection which exists between a cyclone and an anti-cyclone, which are the two principal and primary weather systems, and to watch the behaviour of each so far as the more important changes are concerned.

The forecasts now issued by the Meteorological Office are based upon the telegraphic reports from upwards of 50 stations, which represent not only the entire area of the British Islands, but

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embrace nearly the whole of western Europe, the information extending from Bodö, within the Arctic Circle in the North, to Corunna and Toulon in the South. The height of the barometer and thermometer, with the direction and force of the wind, together with the actual state of the weather conveyed in the telegrams are charted immediately on their receipt, and from an examination of a series of these charts the necessary deductions and conclusions are drawn. Certain recognised laws are known to exist in the relation between the wind and the barometer which form the basis of the first conclusions, and the forecaster has to make an estimate of coming changes. The type of weather which is of the principal importance in our English climate is known as cyclonic, and is essentially associated with wind and rain. In this country 90 per cent. of the cyclonic disturbances which influence our weather move towards some point of east, the most frequent direction being about east-north-east. The velocity with which these disturbances travel varies from about 70 miles an hour to 10 miles an hour, but usually the rate of motion is about 20 miles an hour. The first indication of approaching bad weather is almost always shown at the stations situated in the west of the British Islands, and the changes are propagated from west to east. In winter a cyclonic system is generally possessed of much greater energy than in the summer, owing to the greater difference which exists between the relative readings of the barometer over land and sea, and this is why in winter such disturbances are usually accompanied by violent winds, whilst in summer the more shallow disturbances only occasion rain with sometimes thunder. The warning is the same in the case of a cyclonic system, no matter whether the disturbance is one of greater or less magnitude, except that the intensity of the change is not so great when the wind force is only light. On the first approach of bad weather the barometer falls, the wind backs to south or south-west, the sky becomes cloudy, and frequently rain sets in. These conditions are the especial features peculiar to the front or advance segment of the cyclonic area, and as this passes away to the eastward the barometer commences to rise, the wind shifts to west or north-west, and the sky usually clears. It is this passage of a cyclonic disturbance, or a series of such disturbances, that causes the alternation of wet and fine days so commonly experienced, and which will often continue for a very prolonged period. There is a marked tendency with

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the weather in Western Europe to recur in spells: unsettled weather sets in and continues uninterruptedly for the space of two or three weeks, or it may be even longer; whilst at another time a spell of fine weather sets in and is equally tenacious of its position. The system of synchronous and synoptic meteorology affords a very simple explanation of this, and the tendency to persistency in the character of the weather is clearly attributable to the relative distribution of atmospheric pressure at the time. It is now well-known that cyclonic systems or areas of low barometer readings travel by a very decided preference on the northern side of an anti-cyclonic system or an area of high barometer readings, and a disturbance once formed and acquiring progressive movement cuts out for itself a track under the influence of the disposition of barometer readings in the neighbourhood. The path or passage of a disturbance being once formed, there is an unmistakable tendency for other disturbances to follow in the same track, so that a certain locality may experience similar changes of weather for a considerable period of time. A good illustration of the persistency in the type of weather was afforded in the winter of 1890-1, when for about 60 days an anti-cyclonic area was situated over the southern portion of England, whilst a continued stream of cyclonic disturbances was skirting the coasts of Ireland and Scotland, with the result that in England a most prolonged and intense frost was experienced, whilst the western and northern parts of the United Kingdom enjoyed an almost complete immunity from cold.

Often for weeks together cyclonic systems are constantly reaching our coasts from off the Atlantic, and for the most part they skirt our western and northern coasts, and at other times the whole area of the British Islands is brought under their influence, with the result that the weather over the entire kingdom is very rainy and disturbed. With these conditions there is a constant alternation of rain and sunshine, although the former often seems to greatly predominate. When the cyclonic area is approaching us the barometer commences to fall, and the sky becomes densely clouded, till at length rain sets in; as the disturbance travels away the sky clears for a short time until the influence is felt of another disturbance, when there is a simple repetition of the weather changes indicated. At a time when the type of weather is decidedly cyclonic, the forecaster is very greatly hampered by the frequent formation of subsidiary disturbances which often form within the area of the British

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Islands and travel with considerable speed across the country. These secondaries are seldom accompanied by much wind, but they are generally accompanied by a heavy downpour of rain and often occasion thunder. The magnitude of the disturbance is often too small to be defined on an ordinary weather map, and so they escape detection, and since they most frequently follow in the rear or on the southern edge of a larger or parent disturbance at a time and in a position where finer weather is usually experienced, they constitute a source of considerable anxiety in weather forecasting, being very frequently the cause of failure.

Thunderstorms are not generally easy to foresee, and they differ very materially in character; they have been grouped into three distinct classes. One class is common to the winter months; they usually occur with very disturbed weather and stormy winds, and this class of storm is experienced with equal frequency by day and night. The second class is much more rare; they occur with light winds and are generally very local; but at the same time are often very severe: these almost invariably occur by day. The third class belongs entirely to the hot weather: they extend high into the atmosphere and are not generally local; these are usually very severe, and the lightning is very vivid; but as a rule this class is seldom accompanied by accident—at least, in comparison with the number of discharges—the explanation being that the electrical discharge is more generally confined to the region of the clouds, whereas in the colder season the discharge more commonly takes place between the clouds and the earth.

Weather forecasting is a matter of great simplicity when the conditions are quiet and settled; indeed, at such a time the principal interest is to obtain if possible an estimate of when the weather will again become unsettled. When the conditions are settled for any length of time, either in winter or summer, the type of weather is distinctly anti-cyclonic, and, as the term suggests, the state of affairs are entirely opposed to those when a cyclonic system prevails. Possibly in time a more extended knowledge may be gained with respect to the behaviour of cyclones and anti-cyclones, and their relation one to the other; but until such advance has been made, it is absolutely hopeless to attempt to forecast for a season, or, even at the utmost, more than a day or two in advance. It is, however, quite possible at times for one well versed in meteorological

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changes to make a shrewd guess at the coming weather, based on past experiences, and possibly a systematic effort in this direction might lead to ultimate gain.

CHARLES HARDING.

ICEBERGS.

ICEBERGS, abandoned ships, and fog, are three of the most dreaded hindrances to safe navigation that cumber the restless surface of old ocean. All that can be done to help the toilers of the deep sea is to put in position on comprehensive charts the most reliable limits within which ice is likely to be met with by passing ships; or, better still, to distribute as widely as possible the latest information with respect to icebergs and other dangers. Our Hydrographic Department issues general charts setting forth the equatorial limits of icebergs, but the invaluable Pilot Chart of the North Atlantic, issued every month by the United States Hydrographic Office, has greater exactness to recommend it to navigators crossing that stormy sea, who are supplied with copies thereof without charge. Shipmasters and officers of merchant ships under every flag make careful reports to Washington of the general atmospheric and other phenomena encountered at sea during their passages over various tracks; and the Pilot Chart, embodying the recorded experiences of many, is published at the beginning of each month to aid individual navigators in determining upon a correct course of action in the trying circumstances in which they are not infrequently placed. No fewer than twenty-five thousand copies of these Pilot Charts were distributed gratuitously by the Washington authorities by means of branch offices at the large United States ports during the twelve months ended 30th June, 1891. Commander Richardson Clover, United States Navy, the American Hydrographer, is to be congratulated on the international utility of this accurate and well-arranged guide for North Atlantic navigators. We are indebted to the supplement of the July chart for some of our information with respect to icebergs drifting about off the coast of Newfoundland and to the eastward thereof this season, endangering the safety of some of our noble transatlantic liners.

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The extremities of glaciers entering the sea in high northern latitudes are wrenched off by the upward pressure of the water into which they intrude; and the resulting detached icy masses, acted on by wind and current, are drifted many a league in an equatorial direction until dissolved under the genial influence of a more vertical sun. From the highest point of Whalefish Islands in 69° N., 53° W., at least one thousand icebergs were observed wending their way to the southward, and Markham in his whaling cruise to Baffin's Bay saw fully seven hundred or eight hundred icebergs at one time, some of which were very large. These pests to navigation have been met with in the North Atlantic as early as December; but it may be fairly asserted that they only descend in large numbers to low latitudes in the late Spring or early Summer months. One clear day in January, 1874, the ordinary route by the Flemish Cap was obstructed by an immense icefield to south, north, and east, as far as could be seen from a ship's masthead, and shortly afterwards ships were observed there with sails furled and frozen in firmly. The *Maria* ran into an iceberg on 15th December, 1842, and the *Wabeno* collided with an ice island on 5th December, 1868, when she was so seriously damaged that her crew were compelled to abandon her. In the latter part of January, 1844, the *Virginia*, was thirty-four hours fast in the ice, and on 28th January, 1890, the steamship *Colina* was similarly situated for twelve hours, with engines stopped, in 48° N., 49° W. Next day, about three hundred miles to the southward, the steamship *Mineola* passed an iceberg seven hundred feet high and one mile in length. The barque *Mary*, on 15th February, 1860, was suddenly beset by icebergs, in 47° N., 43° W. Her bow was smashed, and her crew had barely time to get into her frail boats ere she foundered. For five days these suffering seafarers were without sustenance, and two died from exhaustion before a rescuing vessel hove in sight. On 8th February, 1890, the steamship *Yorkshire* supplied the brigantine *Silvia* with provisions, oil, and fuel. The latter vessel had been six days in the ice, and was badly chafed. She was then sixty-seven days out on a passage from Figueira to St. Johns. The steamship *Lepanto* on 10th February, 1890, in 43° N., 49° W., passed an iceberg 500 feet high and a furlong in length. Passages have to be made across the North Atlantic in all kinds of weather, and icebergs, drifting deviously, are a menace to record-breakers cleaving the thick fog near the Banks of

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Newfoundland. Masters and officers of ocean greyhounds are fully alive to the awful responsibility thus thrust upon them at times, when in the words of Spenser—

> Suddenly a grosse fog overspread
> And heaven's cheerfull face enveloped
> That all things one, and one as nothing was
> And this great universe seemed one confused mass.

In July, 1861, the steamer *Canadian*, while going dead slow in thick fog, struck an iceberg which was almost level with the sea surface. In May, 1890, the steamship *Parisian* in 48° N., 40° W., was going six knots an hour in foggy weather when an iceberg was sighted only forty yards ahead. The engines were rapidly reversed, but she ran on an outlying ledge and luckily slipped off into deep water without damage. A week later in 44° N., 48° W., the *Beacon Light* was steaming half speed in a fog, when she collided with an iceberg ninety feet high and six hundred feet long. The blow was a glancing one, nevertheless the danger was imminent and terrible. Falling ice crushed in her forecastle deck, and other pieces that fell into the sea alongside dealt injury to her hull as they rose beneath her. Six days later the Danish steamer *Thingvalla*, in 47° N., 43° W., struck an iceberg twenty feet high and one thousand feet long. Her stem was crushed and sixteen bow-plates cut down to within two feet of the water-line. Much ice fell on her deck and she was detained for sixteen hours making the necessary repairs. A few weeks ago the French steamship *La Touraine* narrowly escaped destruction. A dense fog lifted for a few moments and a huge iceberg was reported as right ahead in just sufficient time to steer clear of it. In July, 1890, an iceberg broke in three pieces at the instant a vessel named the *Portia* was close at hand. One piece came up directly beneath her and she was lifted five feet thereby, strained slightly, and had her rudder twisted. Icebergs were especially numerous in 1890, and the master of a German steamer, the *Slavonia*, reported to the United States Hydrographer that she passed the last remnants of an iceberg on 10th July in 49° N., 24° W. This is probably the nearest approach of icebergs towards our shores since the glacial period. It is thought by some ocean travellers that the proximity of icebergs can be readily detected by frequent observations of the sea surface temperature. We read in one popular work that icebergs "cool the water sensibly to the distance of forty or

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fifty miles around, the thermometer sinking seventeen or eighteen degrees in their neighbourhood," and again, "they cool the water to the distance of thirty or forty miles, and the air to a much greater distance." Another well-known writer on physical geography says that the presence of icebergs "can very generally be told in the Atlantic by steady observations with the thermometer." The testimony of practical navigators, however, is almost unanimously opposed to this view. A cold current of water may be bringing icebergs along with it, but the drifting icy masses are not the cause of the low temperature of the medium in which they float. As a matter of fact, it has often been demonstrated that there is not any appreciable difference in sea surface temperature even when close to the largest of icebergs; and this is not very remarkable, having regard to the poor conductivity for heat possessed by water. Moreover, sea temperature could not possibly be an infallible guide, for icebergs have been observed not only in the warmer water of the Gulf Stream, but also to the southward thereof, having been transported thither by a strong under current. A good look-out man may perchance hear the echo of a steam whistle, or the wash of waves, or see the ice-blink, but there is no doubt that a shipmaster breathes more freely when his good ship has passed the limits of ice laid down on his pilot chart for the current month.

At the British Association meeting of 1842, it was asserted that unusual prevalence of ice in the North Atlantic was probably the cause of the cool summers over our islands of the four immediately preceding years, and it was urged that fifty years previously icebergs did not usually make their appearance in the North Atlantic until autumn. Professor Archibald, not long since, put forward a similar suggestion; but it would probably be easy of disproof by an unbiassed examination of the records during the past few years. The ice season is rather late this year, but during the months of May and June the authorities at Washington received reports of icebergs from two hundred and fifty ships. Captain P. Myrick, the lightkeeper at Cape Race, N.F., reports that ice was exceptionally scarce off that coast during the first three months of the year. He has not known such an absence of all kinds of ice during the last eighteen years, while, at the same time, lakes and ponds of the island were as free from ice as in July.

On 3rd May, the Norwegian barque *Europa* passed thirty-seven icebergs between 49° N., 43° W., and 48° N., 48° W.,

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and the master believed that there were doubtless many more in the vicinity, as the weather was too thick to see very far. Next day, the German steamer *Stubbenhuk* passed sixty bergs in almost the same geographical position. Two days later, the *Lake Winnipeg*, when in 47° N., 46° W., passed twenty-five large bergs in thirty miles. A week later, the *Manhattan* passed an iceberg four hundred feet high and one quarter of a mile in length. On the 15th, the master of the *Ulunda* saw hundreds of bergs of all sizes within two hundred and twenty miles of St. Johns, N.F., and next day a berg was seen aground about half-a-mile from the entrance to that harbour. The German steamer *Hafis*, in 46° N., 47° W., passed a large berg which was six hundred feet high and four miles long! In 50° N., 45° W., the sailing-ship *Habitant* spent two days picking her way through a group of 25 bergs, some of which were of gigantic proportions. The barque *Zimi*, on the 6th June, was beating to the westward in 46° N., 53°W., and every time she stood to the northward it was noticed that the northern edge of the Banks of Newfoundland was crowded with icebergs which were at first mistaken for land covered with snow. The steamer *Prodans*, on 13th June, passed a berg five hundred feet high, and square shaped with a side of one mile!

Ice is also a danger to vessels making southern passages to the Antipodes or rounding Cape Horn. Icebergs from the Antarctic ice barrier are more numerous and more terrible than those from tortuous Arctic glaciers, and drift much nearer to the equator. Being tabular in form, they differ from the fantastically-shaped bergs of northern latitudes, and it has been estimated that thirty years' fog and snow are required to complete the formation of the usual southern berg. The Antarctic ice cap has sufficient seaward slope to permit of a forward movement, and the southern icebergs are enormous masses broken off its outer edge, which forms an icy cliff, with an upper surface glistening like a plain of frosted silver.

Vessels arriving recently at Australia from England report having fallen in with many icebergs to the south-eastward of the Cape of Good Hope. On 12th December, 1891, in 44° S., 14° E., the *Winifred* was surrounded by bergs four hundred feet high, one of the largest of which broke up, but not near enough to injure her. About the same date the *Salamanca* passed ten, and the *Persian Empire* fourteen bergs. Along the Cape Horn route, however, icebergs have been exceptionally immense and

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frequent. From the 4th to the 9th February, between 57° S., 147° W., and 59° S., 109° W., the steamship *Fifeshire* passed very many bergs at short intervals. But little more was heard of southern ice until a few weeks ago. The splendid Aberdeen iron ship *Cromdale*, Captain E. H. Andrew, left Australia on 1st March, and all went well till the 6th April, when running nine knots an hour in 46° S., 36° W., a large iceberg was observed right ahead, but only just in time to steer clear of it. At daylight the sea was found to be studded with icebergs. In the words of the "Ancient Mariner":

> "The ice was here, the ice was there,
> The ice was all around;
> It cracked and growled and roared and howled
> Like noises in a swound."

Sail was reduced, and all hands kept on deck in readiness for any emergency. The *Cromdale* was standing into an extensive horseshoe-shaped bay in the side of an ice island of almost unparalleled magnitude. Vertical icy cliffs, full three hundred feet high, were on each side and ahead, with the sullen sea pouring over them in cascades of salt spray. The good ship was extricated from her perilous position by dint of sterling seamanship, but at one time it seemed that she must inevitably be dashed to pieces, with all hands, on the terrible icy shore under her lee. At least fifty of the many bergs in this bay were peculiarly opaque, and Captain Andrew suggests they had just previously floated with the then upper parts submerged. The sea temperature was fifty-one degrees, and such relatively warm water would rapidly dissolve the under parts of the bergs, and cause them to topple over frequently. The sea surface temperature had been carefully taken at regular intervals; but, as usual, afforded no indication of the proximity of ice, and this observant shipmaster had similar experience three years ago in the ship *Derwent*. Water within half-a-mile of a berg showed no change in temperature. One berg passed by the *Cromdale* was one thousand feet high! This may seem an incredible altitude to dwellers on shore, remembering that only about one-eighth of a floating icy mass is exposed to view. Nevertheless we shall show that other instances of equally lofty ice islands are not far to seek. The barque *Noel*, of Arendal, Captain Jorgenson, passed an ice island one thousand feet high, and nearly seven thousand feet long, when in 50° S., 118° W., on 6th October, 1890. On the 16th of last May the Aberdeen barque *Strathdon*, Captain

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A. T. Wills, encountered foggy weather, and, upon slightly clearing after two days, in 45° S., 25° W., enormous icebergs were discovered in every direction. Fog shut down again, and it was only by skilful handling that she escaped total loss. One ice island, not less than a thousand feet high, was only narrowly cleared! That afternoon she was surrounded by bergs, and the only opening scarcely appeared wide enough for her to pass through. She reached open water by this outlet, but her yards almost grazed the icy heads on each side of her. The weather cleared somewhat and revealed an immense mass of ice, along which she sailed twenty miles to the south-westward, and hove-to for the night. At daylight an ice island, having an altitude of eight hundred or a thousand feet, stretched along to leeward as far as could be seen, and, after sailing forty miles along it, she got into a clear space and hove-to. Next day there were seventy other bergs in sight, but the monster of the previous day had disappeared. The last ice was seen in 42° S., 30° W., on the 22nd. A pleasing and almost unique incident in connection with this danger from ice occurred after the *Strathdon* arrived at London. Captain Wills was presented by his crew with a testimonial expressing their unanimous thanks "in recognition and admiration of the able and seamanlike manner" in which he "handled the ship under circumstances which it has seldom been the misfortune of any merchant vessel and her crew to pass through." Captain Lewis, of the barque *Valdivia*, reported on arrival at Falmouth from Pisagua, that on 21st April, during foggy weather, in 50° S., 50° W., he saw many icebergs. When in 43° S., 35° W., at three o'clock on the morning of the 24th, the *Valdivia* passed a very large berg quite close enough to jump upon it. She was travelling eight knots an hour at that time, but owing to the darkness the berg could not be seen further than a ship's length astern, although when the moon rose it could be distinguished when four miles distant. During the next eight hours she passed eighty-five bergs, some of which could scarcely be discerned until close alongside. They looked excessively opaque from afar off, but nearer proved to be of a dark green colour. The last berg, seen at a distance of ten miles, was fully eight thousand feet long and several hundred feet high. Captain Lewis remarks that the sea surface temperature varied but little on either side of the bergs for some distance. At nine o'clock, on the night of the 27th, in 39° S., 31° W., the barque passed

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a detached piece of ice one hundred feet long, which was first observed by the noise of the sea washing over it. A large number of bergs had been seen that day, and the last was one hundred and thirty miles nearer the equator than the limit laid down on the chart. Captain Lewis had experienced an exceptionally strong current to the north-east for some days, and infers that this accounts for the ice being seen so far to the northward. About one o'clock, on the morning of 23rd April, in very dark rainy weather, the Dundee ship *Duntrune*, bound from Iquique to Dunkirk, when sailing about ten knots an hour, collided with an ice island in 47° S., 38° W., which was not observed till too late. She rebounded and again struck. Her bowsprit broke off, her bows were smashed in, her foretop-mast came down, and the sea swept her decks and poured into the forecastle through the apertures in her bow plates. All hands cleared away the wreck with the indomitable pluck and ready resource of true seamen, while at the same time the boats were prepared lest worse befall them. At daybreak the *Duntrune* lay to windward of an ice island three hundred feet high, which stretched north-east and south-west from horizon to horizon apparently without a break. Her position was far from desirable. Four feet of ice lay on her forecastle deck, the gale shrieked across her rigging, and at any moment another collision might take place with the drifting danger to leeward. Eventually she was steered through a narrow opening and found herself surrounded by hundreds of other bergs with barely two miles of open water. A channel was discovered through this icy circular barrier, and she had only just cleared it when a hugh iceberg broke up, effectually blocking up the passage to safety. Had she have been delayed for ten minutes her loss would have gone to swell the total of inexplicable shipping disappearances. She passed the last ice on the 26th, and the first news of her misfortune reached England by the French steamship *Ville de Rosario*, to which she had signalled near the equator. The *Duntrune* eventually arrived at her destination without further mishap. On 10th May, between 45° S., 37° W., and 43° S., 35° W., the ship *Invercargill* passed more than one hundred bergs. One was three hundred feet high, and over a mile in length. Many of the others were of equal altitude. The *Hesperus*, when in 44° S., 39° W., on 18th May, passed a white berg, in shape a square of one mile side; and its height, measured by sextant, four hundred feet.

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Another berg was brown and black, giving it the exact appearance of an earthy island. Captain Ross, the Antarctic explorer, many years ago saw a southern berg with large pieces of rock upon it weighing many tons, and nearly covered with mud and stones. Specimens of the rock were procured, and proved to be of volcanic origin. Another berg, somewhat similarly laden, was deemed an island, and the delusion only dispelled by landing thereon. In the early morning of the 21st May the four-masted ship *LochTorridon*, Captain Pattmann, sighted an iceberg in 45° S., 34° W., and by noon the whole sea as seen from aloft seemed strewed with icebergs all around, which were two hundred feet high and four hundred feet long. On 2nd June, in 45° S., 37° W., the *County of Edinburgh* passed numerous bergs extending one hundred miles and ranging from two hundred to nine hundred feet high.

It will be seen that the southern icebergs are of unusual proportions and moving in close array this year, but we should be wrong to assume that they have broken the record. Icebergs of the southern hemisphere have not infrequently been reported of heights surpassing the limits of belief. An immense icy mass was passed by twenty-one ships between December, 1854, and April, 1855, drifting about in 40° S., 20° W. It was three hundred feet high, sixty miles long, and shaped like a horseshoe, presenting to unwary navigators a sheltered bay between its arms not less than forty miles across. The steamship *Great Britain* steamed fifty miles along the outer side of one arm; and an emigrant ship, the *Guiding Star*, having sailed into this icy bay, was lost with all hands. Two other ships, the *Cambridge* and the *Salem*, are known to have also been embayed, but fortunately were extricated without damage. A similar, but smaller, berg was once met with by the *Agra* in the North Atlantic. She ran into a bay in the centre of an iceberg which was nearly two miles across at the entrance, and experienced great difficulty in beating out again. In August, 1840, the Dutch ship, *Generaal Baron von Geen*, in 38° S., 15° E., passed an ice island one thousand feet high, and the *Agneta*, in March, 1855, passed one nine hundred and sixty feet high, in 53° S., 15° E. In May, 1887, the barque *Inchgreen* passed close alongside of an iceberg in the lone southern ocean, which was estimated by Captain Miller, her commander, to have had an altitude of seven hundred feet above the sea surface, and to have been quite seven miles in length. In December, 1856, a vessel passed four large bergs close together

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in 50° S., 43° W., one of which was seven hundred feet high. Even when southern icebergs are less lofty than those above quoted, they far exceed the northern icebergs in their other dimensions. In September, 1865, the *Alice Davies*, in 47° S., 39° W., passed a flat-topped ice island, which was about twenty-five miles long in a north and south direction, but extended to the north-west further than the eye could perceive. The *Edmond*, Captain Smithers, in December, 1859, passed a berg five hundred and eighty feet high, in 51° S., 44° W., which so much resembled a rocky island, that it was reported as such. About a fortnight earlier the *Gleaner* had passed a berg two hundred feet high when one degree further to the westward, which was equally difficult to distinguish from land until she sailed close to it. In December, 1861, the *Queen of Nations* fell in with a berg in 57° S., 146° W., which appeared to have much earth adhering to it, and in 54° S., 170° W., she passed a larger one, not less than seven hundred and twenty feet high. In November, 1854, the *Great Britain* passed no fewer than two hundred and eighty bergs while running along the 56th parallel of south latitude between the 112th and 92nd meridians of west longitude, while at the same time the *Golden Era*, proceeding along the 63rd parallel, did not meet ice until the 72nd meridian was reached, when she was surrounded by ice, and narrowly escaped destruction.

Other well authenticated instances might be given of immense icebergs, or ice islands as they are termed indifferently by navigators, having been passed by ships in high southern latitudes, but we have written sufficient to demonstrate that an altitude of one thousand feet above the sea surface, as reported by Captain Andrew, of the *Cromdale*, is quite within the limits of probability for southern icebergs, even after making due allowance for the chance of error naturally present at a time when astonishment and imagination most powerfully affect an anxious observer.

From information set forth on the more recent issues of the weekly United States Hydrographical Bulletin, we gather that some of the passenger steamships have crossed the Atlantic between the Old World and the New without any ice having been seen by those on board. It does not, however, follow that icebergs were not nigh in the vicinity of the Banks of Newfoundland in foggy weather.

METEOR.

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EXPLOSIVE SIGNALS.

A MEMORANDUM recently prepared by Colonel Majendie, the Inspector of Explosives, and issued by the Board of Trade, deals with the dangers which often accompany the storage and use of explosive signals on board ship. The whole subject affords more than one illustration of the difficulty of keeping in order arrangements, not for ordinary everyday use, but for cases of emergency of rare occurrence. Any part of the equipment of a ship which is in constant use tells the tale itself if it gets out of order, and with the exercise of reasonable care is at once set right. Danger signals are always carried, but, being seldom required, their condition is not known, and they may become inefficient, and even sources of danger. Thus the gun which was formerly carried in accordance with the provisions of the Merchant Shipping Acts was often made a receptacle of rubbish, and when wanted it was, perhaps, found that the touch-hole was closed with rust, and the gun itself was in such a condition that it was dangerous to fire it. Of late years the gun has been pretty generally superseded by explosive signals, which are handier and more efficient. These, however, require more care than is frequently bestowed upon them, as is seen by the memorandum to which we have referred, and which is the outcome of an investigation of the circumstances attending an explosion on board a floating magazine in the River Thames below Gravesend.

It is the custom for homeward bound vessels to be relieved of their portable magazines which contain signal-lights, rockets, &c., at the place in question, where the explosives are kept until the ship leaves on her outward voyage, when she receives them again. On a cold day in January last, when some cases of explosives, which came from a steamer, were being got on board the floating magazine, some of them exploded and set fire to other explosives in the magazine vessel, and very great damage would no doubt have resulted, possibly with loss of life, but for the fact that the magazine keeper promptly opened a flooding valve, and thus sank the vessel. On account of the weather at the time, spontaneous ignition was practically out of the question, and after a careful enquiry, Colonel Majendie came to the conclusion that the explosion was caused by a signal-rocket itself being damaged.

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The arrangements for igniting the signal-light when it is used are similar in principle to the ordinary safety-match, which will only fire when rubbed on the composition with which the outside of its box is coated. If a box were so damaged that the lucifers and the composition were brought into proximity, then a mere shake would be sufficient to ignite them. Similarly, the signal-lights in this case had been so injured by frequent handling or knocking about that portions of them which should be kept apart had been brought together, and as a consequence the hauling about of the portable magazine in which they were kept was sufficient to furnish the friction necessary to cause ignition.

Similar accidents have occurred from similar causes at various times during the past few years, and the Board of Trade have therefore issued recommendations, made by Colonel Majendie, with a view to their prevention.

Danger is, as we have seen, caused by the accidental contact and rubbing of substances which are intended to be brought into contact only when it is desired to fire the signal. The body of the signal consists of an explosive composition contained in a cylindrical paper case. It is covered with a thin textile fabric, on the outside of which is a dot of chlorate of potassium and sulphide of antimony; over this is a cardboard cap, the outer upper surface of which is covered with amorphous phosphorus. This cardboard cap is in its turn protected and kept in its place with a metal cap. To fire the light it is necessary to remove the metal cap, reverse the cardboard cap, and rub the dot of chlorate of potash against the phosphorus surface of the cap.

Among the sources of risk are the detachment or fracture of the protecting cap, the exposure of the compositions in such manner that their accidental contact becomes possible; the detachment of particles of one of the compositions and the working of them through interstices within the cap into contact with the composition by which the frictional action is completed; or the accidental ignition by means of a sharp blow or friction of some of the amorphous phosphorus itself, whether detached from the cap or plug, or existing on a plug which has become itself detached. In some cases the signal-lights are manufactured without a metal cap, or with a soft tinfoil cap only; these are even still more liable to get out of order.

To prevent accident considerable care is needed in the handling of signal-lights and of the boxes containing them. Colonel Majendie recommends especially that if a light is taken out of a box and not used care should be taken, before it

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is replaced, to see that the cap is securely fitted and uninjured, and in the case of lights provided with phosphorus-tipped plugs, that the plugs are not loose or detached. Any light, the cap or plug of which has become detached or is insecure, or apparently defective, should be thrown overboard. Frictional lights should always be kept in a box or case by themselves, and the boxes or cases should be required to be of a construction which allows as little play as possible to the light. From time to time the lights should be examined as to the security and condition of the caps and plugs.

As regards the quality of the signal-lights themselves, Colonel Majendie recommends that none should be used which have a paper cap only instead of a metallic cap, the former being obviously more liable to injury from damp, or by knocking about during the voyage, or by rough handling. In respect of signal-lights altogether, it is obviously the best economy to have an article of undoubtedly good make; and it is also important that those in whose charge they are in the ship should inspect them carefully when they are received.

THE MERCANTILE SHIPOWNING OF THE WORLD.

TWO years have elapsed since we last reviewed the statistics of the mercantile shipbuilding of the world, annually published by the Committee of Lloyd's Register of British and Foreign Shipping. We now take the opportunity of culling from this authoritative source various particulars of the shipping afloat at the close of the years 1890 and 1891. Sailing-vessels below 100 tons net register, and steam-vessels below 100 tons gross register being excluded.

TABLE I.

SHOWING THE TOTAL NUMBER AND TONNAGE OF ALL SEA-GOING VESSELS FOR ALL COUNTRIES OF THE WORLD IN THE YEARS 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Great Britain:				
United Kingdom	9,098	10,585,747	9,260	11,157,662
Colonies	2,808	1,342,877	2,705	1,298,025
Total	11,906	11,928,624	11,965	12,455,687

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	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
United States ...	3,357 ...	1,943,442	3,297 ...	1,926,426
Germany ...	1,864 ...	1,678,446	1,851 ...	1,703,754
Norway ...	3,394 ...	1,665,477	3,333 ...	1,681,759
France ...	1,345 ...	1,082,674	1,210 ...	1,057,708
Italy	1,574 ...	828,158	1,400 ...	818,840
Spain	868 ...	539,372	880 ...	554,962
Sweden ...	1,452 ...	473,101	1,477 ...	498,505
Russia	1,173 ...	426,765	1,196 ...	481,799
Holland ...	533 ...	401,273	517 ...	435,791
Greece	1,014 ...	332,107	1,030 ...	356,483
Denmark ...	818 ...	295,944	840 ...	310,676
Austria-Hungary	349 ...	265,980	345 ...	273,812
Turkey	947 ...	239,481	939 ...	235,172
Brazil	524 ...	167,249	560 ...	199,972
Japan	354 ...	178,800	333 ...	164,302
Belgium ...	90 ...	111,744	90 ...	112,541
Chili	147 ...	100,394	142 ...	102,595
Portugal ...	208 ...	91,783	187 ...	97,168
Argentine ...	143 ...	50,825	147 ...	50,683
China	40 ...	43,825	45 ...	48,566
Hawaii	25 ...	16,498	26 ...	22,489
Egypt	— ...	—	36 ...	20,689
Uruguay ...	33 ...	12,102	33 ...	11,929
Peru	36 ...	11,005	37 ...	11,625
Mexico	32 ...	10,254	30 ..	7,637
Montenegro ...	18 ...	5,047	22 ...	5,999
Zanzibar ...	5 ...	4,314	5 ...	4,314
Siam	9 ...	3,708	8 ...	3,453
Venezuela ...	12 ...	2,913	13 ...	3,337
Columbia ...	3 ...	685	8 ...	2,928
Hayti	8 ...	1,814	6 ...	1,842
Sarawak ...	7 ...	2,616	4 ...	1,431
Roumania ...	5 ...	936	5 ...	936
Bolivia... ...	3 ...	2,302	1 ...	921
Costa Rica ...	4 ...	1,103	3 ...	846
Persia	1 ...	838	1 ...	838
Other Countries	25 ...	18,359	44 ...	26,093
Totals ...	32,326	22,939,958	32,066	23,694,508

Despite the increases in the tonnage afloat, which have been annually witnessed without interruption during the past four

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years, there was, until the year 1890, more or less greater decreases each year in the number of vessels afloat. In the year 1885 there were 35,408 vessels presumably at work; but, as will be seen from Table IV., in the year 1889 there were only 32,298 vessels, a decrease of 3,110 vessels, and which must have seriously affected the position of many master mariners, officers and seamen. In the year 1890 there was a slight reaction, the number of vessels increasing by 28 to 32,326; but in the year 1891 this temporary gain was more than neutralised by a decrease of 260, bringing down the number of vessels afloat to 32,066.

Glancing at the total tonnage existing during the last three years, the year 1890 shows an increase of 788,307 tons over the preceding year, and the year 1891 has another increase of 754,550 tons over the year 1890; or, for two years, an increase of 1,542,857 tons. But these figures do not fairly represent the enormous increase there has been in the supply of tonnage.

Allowing that a steamer was equal to three sailing-vessels of the same size for cargo carrying purposes, the increase during the last two years is actually more than thrice as great as it appears from the statistics furnished in *Lloyd's Register*. Taking the above basis for efficient tonnage, the following are the corresponding figures for the last four biennial periods:—

Year.	Efficient Tons.
1885	42,090,338
1887	42,574,951
1889	48,122,395
1891	52,818,614

In six years there has been upwards of 25 per cent. increase in the *efficient* tonnage afloat. Even in the year 1887, when the registered tonnage was at its lowest point for the last seven years, there was actually on this basis of comparison an increase, and since then the tonnage has gone up with bounds and leaps. It is not, therefore, surprising that it is now, and has been for some time, the experience of shipowners that freights are frequently unprofitable, and that steamers not fitted with the latest machinery and built so as to carry the maximum cargoes in a given trade, are better laid up than at work. The supply of tonnage has for some time overtaken the demand, and, unfortunately for shipping investors, this state of matters is being further accentuated during the current year.

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The United States still, it will be seen from Table I., nominally holds the second place as a shipowning nation, but on the basis already employed for *efficient* tonnage, the four countries ranking after the United Kingdom stand as follows :—

Germany	3,881,414	tons.
United States of America	3,070,930	,,
France	2,765,306	,,
Norway	2,352,823	,,

Germany has during the last two years materially increased her lead, and of the four, France has made least progress, and, as will be seen from Table I., both the United States and France have *less registered* tonnage in the last year than in the year 1890.

The United Kingdom continues, however, to distance all competitors, having an increase of registered tonnage for the year 1890 of 343,891 tons as compared with the year 1889, and a further increase of 571,915 tons for the year 1891, or an aggregate increase for two years of 915,806 tons, nearly two-thirds of the entire increase for the world during the same period. The British Colonies show decreases for both years, and, comparing the figures for 1891 and 1890, it will be seen there have been decreases in the tonnage owned in the following countries (besides the United States and France already mentioned), viz., Italy, Turkey, Japan, Argentine, Uruguay, Mexico, Siam, Sarawak, Bolivia, and Costa Rica. The stationary countries are Persia, Roumania, Hayti, and Zanzibar. All other countries have more or less important increases, and it is noteworthy Egypt appears for the first time distinctively as a shipowning country.

It will be of interest to give the average tonnage of vessels existing in the world and in the United Kingdom during the last seven years.

Year.	Average Tonnage of Vessels in all the World.	Average Tonnage of Vessels in the United Kingdom.
1885 ...	607·4 ...	928·6
1886 ...	596·2 ...	907·1
1887 ...	624·6 ...	1004·0
1888 ...	644·4 ...	1055·4
1889 ...	665·8 ...	1117·2
1890 ...	709·6 ...	1163·5
1891 ...	738·9 ...	1204·9

It appears that foreign competition is being increasingly successful in the short voyage trades in which small sailing-

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vessels are employed—the attention of our shipowners being principally given to heavy dead-weight carrying tonnage. Further, our Continental rivals have the benefit of cheaper labour, and less onerous restrictions.

TABLE II.

SHOWING THE TOTAL NUMBER AND TONNAGE OF ALL SEA-GOING SAILING-VESSELS FOR ALL COUNTRIES OF THE WORLD IN THE YEARS 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Great Britain:				
United Kingdom	3,342	2,417,985	3,225	2,555,983
Colonies	1,969	857,096	1,859	782,821
Total	5,311	3,275,081	5,084	3,338,804
United States	2,897	1,356,000	2,866	1,354,174
Norway	2,921	1,360,241	2,818	1,346,212
Germany	1,058	623,547	1,005	614,924
Italy	1,357	524,234	1,173	501,643
Sweden	961	283,238	960	288,751
Russia	934	268,223	947	276,706
Greece	910	231,795	918	236,914
France	803	234,152	678	203,909
Turkey	846	166,774	854	169,639
Holland	352	154,203	316	150,987
Denmark	587	126,461	604	136,782
Spain	478	116,118	471	118,037
Austria-Hungary	218	108,792	207	101,437
Brazil	388	85,551	380	83,884
Chili	117	67,916	108	63,735
Portugal	161	42,580	141	40,380
Argentine	81	27,587	89	30,155
Japan	99	27,205	83	21,810
Hawaii	9	5,397	9	10,641
Peru	35	8,957	36	9,525
Egypt	—	—	20	4,493
Montenegro	17	3,190	21	4,142
Mexico	16	3,302	15	3,127
Uruguay	12	2,532	13	2,675
Siam	6	3,064	5	2,607
Columbia	2	444	6	2,587
Belgium	10	3,374	8	2,429
Venezuela	6	980	6	1,052

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	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels	Tonnage.
Bolivia	3 ...	2,302	1 ...	921
China	7 ...	1,282	4 ...	760
Roumania ...	2 ...	407	2 ...	407
Sarawak	1 ...	347	1 ...	347
Costa Rica ...	1 ...	288	1 ...	318
Hayti	3 ...	475	1 ...	223
Other Countries ...	12 ...	7,410	22 ...	7,368
Totals	...20,621 ...	9,123,449	19,873 ...	9,132,505

For years, not only have sailing-vessels decreased in number, but also in their aggregate tonnage. In the year 1891 this ceased to be true, as although there was a decrease of 748 vessels, the tonnage increased by 9,056 tons. This break in the monotony of the steady decrease in the tonnage is due principally to a spurt in the building of sailing-vessels—for owners in the United Kingdom—as the tonnage of this class of vessels owned in the British Isles increased by 137,998 tons. It is clearly apparent that elsewhere there have been decreases. The British Colonies have the largest falling off, having for the year 1891 a decrease of over 74,000 tons. Italy comes next, with over 22,000 tons diminished tonnage, and Norway with over 14,000 tons. The United States, Germany, France, Holland, Spain, Austria-Hungary, Brazil, Chili, Portugal, Japan, Mexico, Siam, Belgium, Bolivia, China, and Hayti are also amongst the countries that have decreased their holdings in sailing tonnage. Besides the United Kingdom, there are several countries which had minor increases: Hawaii nearly doubled, Columbia more than quintupled their respective tonnages, and Sweden, Russia, Greece, Turkey, Denmark, Argentine, Peru, Montenegro, Uruguay, Venezuela, and Costa Rica each added their quota.

TABLE III.

SHOWING THE TOTAL NUMBER AND TONNAGE OF ALL SEA-GOING STEAM-VESSELS FOR ALL COUNTRIES OF THE WORLD IN THE YEARS 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Great Britain :				
United Kingdom	5,756 ...	8,167,762	6,035 ...	8,601,679
Colonies ...	839 ...	485,781	846 ...	515,204
Total ...	6,595 ...	8,653,543	6,881 ...	9,116,883

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	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Germany	806	1,054,899	846	1,088,830
France	542	848,522	532	853,799
United States	460	587,442	431	572,252
Spain	390	423,254	409	436,925
Norway	473	305,236	515	335,537
Italy	217	303,924	227	317,197
Holland	181	247,070	201	284,804
Sweden	491	189,863	517	209,754
Russia	239	158,542	249	205,093
Denmark	231	169,483	236	173,894
Austria-Hungary	131	157,188	138	172,375
Japan	255	151,595	250	142,492
Greece	104	100,312	112	119,569
Brazil	136	81,698	180	116,088
Belgium	80	108,370	82	110,112
Turkey	101	72,707	85	65,533
Portugal	47	49,203	46	56,788
China	33	42,543	41	47,806
Chili	30	32,478	34	38,860
Argentine	62	23,238	58	20,528
Egypt	—	—	16	16,196
Hawaii	16	11,101	17	11,848
Uruguay	21	9,570	20	9,254
Mexico	16	6,952	15	4,510
Zanzibar	5	4,314	5	4,314
Venezuela	6	1,933	7	2,285
Peru	1	2,048	1	2,100
Montenegro	1	1,857	1	1,857
Hayti	5	1,339	5	1,619
Sarawak	6	2,269	3	1,084
Siam	3	644	3	846
Persia	1	838	1	838
Roumania	3	529	3	529
Costa Rica	3	815	2	528
Columbia	1	241	2	341
Other Countries	13	10,949	22	18,725
Total	11,705	13,816,509	12,193	14,562,003

There is no break in the uniformity of increase in the steam tonnage of the world. In the year 1890 there was an increase

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of 831,137 tons over the preceding year, and in the year 1891 a further increase of 745,494 tons. The enormous growth of steam shipping during even the last seven years is truly marvellous. In that period, for which the aggregate number of steamers and their tonnage is given in Table VI., the number of steamers has increased by 2,551, and their tonnage by 4,270,762 gross registered tons, an increase of over 40 per cent. The United Kingdom has absorbed the bulk of the increases. In the year 1890 its steam tonnage increased by 393,118 tons, and in the year 1891 by 433,917 tons, but great as are these increases they are not proportionately so large as the increase in the world's steam tonnage. Other countries continue to make headway. Germany in the two years, 1890 and 1891, added 75 vessels and 159,919 tons to her mercantile steam fleets; France 6 vessels and 44,201 tons; the United States 15 vessels and 54,858 tons; Spain 20 vessels and 22,108 tons; Norway 120 vessels and 88,868 tons. This comparison can be further pursued by our readers, by consulting the statistics published in a similar article in the *Nautical Magazine* of September, 1890, Vol. LIX., pp. 741—752. During the last year, the bulk of the countries did more or less increase their steam tonnage, the exceptions being Zanzibar, Montenegro, Persia, and Roumania, these countries maintaining their former state, and the United States, Japan, Turkey, Argentine, Uruguay, Mexico, Hayti, Sarawak, and Costa Rica, each of which retrograded.

TABLE IV.

SHOWING THE MATERIALS OF WHICH THE SEA-GOING VESSELS EXISTING IN THE YEARS 1890 AND 1891 WERE BUILT.

STEAM-VESSELS.

	1890.		1891.	
Material.	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Iron ...	7,606 ...	8,252,841	7,531 ...	8,058,848
Steel ...	2,941 ...	5,145,588	3,516 ...	6,098,411
Composite	152 ...	42,873	148 ...	41,429
Wood ...	1,006 ...	375,207	998 ...	363,315
Total	11,705 ...	13,816,509	12,193 ...	14,562,003

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SAILING-VESSELS.

Material.	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Iron ...	1,824 ...	1,963,109	1,807 ...	1,924,915
Steel ...	349 ...	512,865	598 ...	916,683
Composite	136 ...	99,488	125 ...	91,154
Wood ...	18,312 ...	6,547,987	17,343 ...	6,199,753
Total	20,621 ...	9,123,449	19,873 ...	9,132,505
Grand Total	32,326 ...	22,939,958	32,066 ...	23,694,508

TABLE V.

SEVEN YEARS' COMPARISON OF THE TONNAGE OF SAILING AND STEAM SEA-GOING VESSELS, AND TOTAL TONNAGE OWNED IN ALL COUNTRIES OF THE WORLD BUILT OF STEEL.

	STEAM-VESSELS.		SAILING-VESSELS.		TOTAL.	
Year.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1885 ...	633 ...	995,725 ...	65 ...	83,177 ...	698 ...	1,078,902
1886 ...	770 ...	1,206,962 ...	82 ...	102,319 ...	852 ...	1,309,281
1887 ...	1,094 ...	1,746,467 ...	122 ...	144,590 ...	1,216 ...	1,891,057
1888 ...	1,522 ...	2,563,612 ...	177 ...	231,092 ...	1,699 ...	2,794,704
1889 ...	2,343 ...	4,086,555 ...	248 ...	348,653 ...	2,591 ...	4,435,208
1890 ...	2,941 ...	5,145,588 ...	349 ...	512,865 ...	3,290 ...	5,658,453
1891 ...	3,516 ...	6,098,411 ...	598 ...	916,683 ...	4,114 ...	7,015,094

There is not much room for comment in the two foregoing tables. The most noteworthy features are the great increase of sailing-vessels built of steel in the year 1891, and that wood ships are in a less proportion; iron vessels are disappearing.

TABLE VI.

SHOWING COMPARISON OF TOTAL NUMBER OF STEAM AND SAILING SEA-GOING VESSELS AND THEIR TONNAGE FOR ALL COUNTRIES OF THE WORLD, EXISTING DURING EACH OF THE LAST SEVEN YEARS.

	STEAMERS.		SAILING-VESSELS.		TOTAL.	
Year.	No. of Vessels.	Tonnage of Vessels.	No. of Vessels.	Tonnage of Vessels.	No. of Vessels.	Tonnage of Vessels.
1885 ...	9,642 ...	10,291,241	25,766 ...	11,216,615	35,408 ...	21,507,856
1886 ...	9,969 ...	10,531,843	25,155 ...	10,411,807	35,124 ...	20,943,650
1887 ...	9,890 ...	10,918,153	23,310 ...	9,820,492	33,200 ...	20,738,645
1888 ...	10,260 ...	11,552,101	22,402 ...	9,496,603	32,662 ...	21,048,704
1889 ...	11,101 ...	12,985,372	21,190 ...	9,166,279	32,298 ...	22,151,651
1890 ...	11,705 ...	13,816,509	20,621 ...	9,123,449	32,326 ...	22,939,958
1891 ...	12,193 ...	14,562,003	19,873 ...	9,132,505	32,066 ...	23,694,508

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This table shows at a glance the fluctuations in the steam sailing and total tonnage of the world, as well as in the respective number of vessels. Already reference has been made to the great expansion that shipping has undergone, and here it may suffice to consider the average size of vessel. Steam-vessels, during the seven years, have increased in size, the average tonnage in the year 1885 being 1067·3 tons, while in the last year (1891) the average is 1194·2 tons. In 1886, there was a slight relapse to 1056·3 tons, but since then progress in this direction has been unbroken, 1103·9 tons being reached in the following year; in 1888, the average was 1125·9 tons; in 1889, 1169·0 tons; in 1890, it was 1180·3 tons; and in the last year, 1194·2 tons. Sailing-vessels do not so rapidly or to such a great extent increase in size, very large ones being exceptional. At the commencement of the Septennial period under review their average was 435·3 tons, then it fell in the following year to 413·9 tons, rising in the year 1887 to 421·2 tons, in the next year to 423·9 tons, in 1889 it reached 432·5 tons; in 1890 the average sailing-vessel was 442·4 tons, and in the year 1891 it was 459·5 tons, an increase of barely 24 tons in seven years.

TABLE VII.

SHOWING NUMBER, DESCRIPTION, AND TONNAGE, OF VESSELS DEDUCTED FROM THE MERCHANT NAVIES OF THE SPECIFIED COUNTRIES OWING TO BEING SOLD FOREIGN IN 1891.

	SAILING-VESSELS.		STEAM-VESSELS.		TOTAL VESSELS.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
United Kingdom	55	41,662	99	114,539	154	156,201
France	14	7,233	14	10,440	28	17,673
Germany	67	28,410	13	11,067	80	39,477
Italy	52	20,386	2	6,179	54	26,565
Norway	22	9,768	4	2,370	26	12,138
Sweden	15	7,264	6	1,618	21	9,242
Total	225	115,084	138	146,213	363	261,296

There is less buying and selling of old vessels between shipowners of different nationalities than in previous years, *e.g.*, in the year 1889, which compared favourably with the preceding year, 505 vessels of 338,864 tons were so dealt with. 271 of these vessels of 221,317 tons were owned in the

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United Kingdom, whereas, in the year 1891, as will be seen from Table VII., there were only 154 vessels of 156,201, and in the year 1890 there were 194 vessels of 154,710 tons.

TABLE VIII.

SHOWING NUMBER, DESCRIPTION, AND TONNAGE, OF VESSELS DEDUCTED, OWING TO LOSS, BREAKING UP, &C., DURING 1891, FROM THE MERCHANT NAVIES OF THE SPECIFIED COUNTRIES.

	Sailing-Vessels.		Steam-Vessels.		Total Vessels.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
United Kingdom	170	97,346	120	155,204	290	252,550
France	58	20,961	10	13,494	68	34,455
Germany	46	23,234	18	26,108	64	49,342
Italy	44	16,995	4	6,160	48	23,155
Norway	166	71,749	14	13,122	180	84,871
Sweden	45	14,668	1	155	46	14,823
Total	529	244,953	167	214,243	696	459,196

It is to be regretted that the information contained in Table VIII. is not further sub-divided to show the actual losses by wrecks, founderings, &c.; but provided these are in ordinary ratio to vessels breaking up, the total 696 vessels of 459,196 tons compares favourably with the corresponding figures, 773 vessels of 515,051 tons in the year 1890, and 812 vessels of 475,749 tons in the year 1889. The United Kingdom comes out well in comparison, especially with Norway, which has a heavy proportion of vessels lost, &c., as it also had in the year 1889. Possibly, much of the tonnage of that country is such as would not satisfy Lloyd's or our Board of Trade surveyors.

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RECENT ANNEXATIONS IN THE PACIFIC.

IN view of the recent report that Her Majesty's cruisers have taken possession of Johnston, Gardner, Danger and Nassau islands, in the Central Pacific, presumably for the purpose of laying down a telegraphic cable across the Pacific Ocean, we give a brief description of those islands. A further report states that H.M.'s cruiser *Curaçao* has also visited Pango Pango harbour in Tutuila Island, one of the Samoa group, for the purpose of ascertaining its capabilities as a suitable place for a coaling station for the Australian squadron. We give a description of this harbour, which previous to the loss sustained by the American fleet in the hurricane in 1889, had been used by them.

JOHNSTON ISLAND was discovered by Capt. Johnston of H.M.S. *Cornwallis* in 1807. It was subsequently visited by Wilkes' U.S. Exploring Expedition, and partially surveyed later, in 1859, by Lieut. Brooke, of U.S. schooner *Fenimore Cooper*. It is described as being a lagoon island, and the reef of an irregular quadrilateral form, 3½ miles long N. by E. and S. by W., and 3¼ miles wide. On the reef are two islets, a mile apart, the larger islet half-a-mile long E.N.E. and W.S.W.; and the smaller islet a mere sandbank, a quarter of a mile in diameter. Breakers extend to northward nearly 1½ miles, and a bank surrounds the reef, extending in a south-easterly direction 5 to 6 miles, with 10 to 20 fathoms water. For some time the island was occupied by the Pacific Guano Company.

The best *anchorage* is three-quarters of a mile S.S.E.-ward of the flagstaff on the western and larger islet. Position, lat. 16° 45′ N., long. 169° 30′ W.

The surrounding sea abounds with excellent fish, and birds are very numerous.

Johnston Island may be the Baxos de Villalobos of old Spanish charts.

At the time of the annexation the island was covered with birds' nests, there were no trees, but abundance of guano. The island will be used in connection with the projected Pacific telegraph cable.

GARDNER or KEMINS ISLAND is the south-westernmost of the Phœnix group. It is a low coral island with a shallow lagoon, and 40 feet high to the top of the trees; there is no

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navigable passage into the lagoon. Position, lat. 4° 37¾′ S., long. 174° 39¼′ W.

The DANGER ISLANDS, three in number, were discovered by Commodore Byron, H.M.S. *Dolphin*, in 1765. They are situated within a reef, 8 miles long, and 4 miles wide, which is very dangerous. There is no entrance to the reef, and there is deep water close to it. Puka Puka (the northern island and only one inhabited) is 80 ft. high. Motukavata is 125 ft. high, and Motukoe 100 ft. high. The only landing-place is on the north side of Puka Puka, and here it is only practicable in a native canoe; the N.E. point of this island is in lat. 10° 53′ S., long. 165° 45½′ W. The products are taro and cocoa-nuts.

NASSAU ISLAND, discovered in 1835, by an American whaler, is 7 cables long and 5 cables wide; it is surrounded by a fringing reef, and the best, but very indifferent, landing-place is at the N.W. point of the island. The north point is in lat. 11° 33½′ S., long. 165° 25′ W. The island is covered with cocoa-nut and other trees recently planted. The water is very deep around it.

PANGO PANGO, the best and safest harbour on the island of Tutuila, one of Samoa group, is on the south side of the island, and has been selected as a suitable place for a coaling station for the Australian squadron. Tutuila Island, 17 miles long and 5 miles wide, is the south-easternmost of the Samoa group; it is high, of volcanic appearance, and has several anchorages on its northern coast.

The following information on, and sailing directions for Pongo Pongo, were issued by the U.S. Hydrographic Office, from the survey of Commander R. W. Meade, U.S.S. *Narragansett*.

Making Pongo Pongo, the following landmarks are not easily mistaken:—The small island of Aunu, 65 ft. high, 7 miles E. by N. from Breaker Point, and about three-fourths of a mile E.S.E. from Red Point; Sail Rock Point 5 miles to the S. and W. of Breaker Point; the sharp peak of Matafao, 2,359 ft. high (the highest point of the island), on the left of the entrance; the flat, dome-shaped peak of Peiva, 1,470 ft. high, on the right of the entrance; and Tower Rock under Point Distress and within the shore reef, about 40 ft. in diameter, with its perpendicular sides rising to a height of from 50 to 60 ft., and its summit covered with verdure.

The 4½-fathom patch, over which the sea breaks in bad weather, is on the extremity of the reef extending from Aunu

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Island; it bears S. by E., 1½ miles from Breaker Point, and is the only danger to be avoided outside the shore reefs. These reefs extend from 100 to 200 yards from the beach; they are perpendicular or shelving on their outer edge, and are awash at low water. The surf breaks over them at all times, distinctly marking their outline.

In making the harbour from the northward under steam, I would recommend the channel between Aunu and Tutuila. This channel is half-a-mile wide and perfectly clear.

Having entered the channel midway between Aunu and Red Point, steer about S.W. by W. ½ W., until abreast of Round Bluff; then W. by S., heading for the peak of Matafao, keeping Tower Rock a little open on the starboard bow until up with Breaker Point; then haul in, giving the point a berth of about one cable when bearing E.N.E., then steer N.N.W. ½ W., 2½ cables, until Bluff Point bears west, when the northern side of Whale Rock will be in line with that point, distant from the ship about 1½ cables; then steer N.W. ¼ N. 1 mile, keeping the native village of Leloaloa a little open on the starboard-bow, avoiding the reef off Goat Island, until the inner bay is open W. ½ S.; then stand in mid-channel.

There is good anchorage anywhere in the inner harbour, in from 6 to 25 fathoms water, blue mud and sand bottom, excellent holding ground. The best anchorage for large vessels is off Fonga-Tongo in 20 fathoms water. Vessels of 1,000 tons and upwards should not anchor in less than 16 fathoms, as the harbour becomes narrow for large ships to swing at single anchor.

Sailing-vessels will experience no difficulty in entering the harbour, as the trades blow directly in. A good working ship may beat out against the trades, but the harbour is narrow and lined with coral reefs on both sides, and after passing Goat Island a heavy swell will often be encountered; therefore, it would generally be preferable to go out with the land breeze, which usually blows from 2 to 5 or 6 a.m. The only difficulty in going out with this wind is the liability of losing it before getting sufficiently clear of Breaker Point to allow a vessel to wait for the trade-wind to come in without the disagreeable necessity of anchoring in from 35 to 37 fathoms of water. The surf always breaks heavily on Breaker Point and on the reef outside of Point Distress, and if a vessel loses the wind before getting clear of them she had better anchor at once.

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During the winter months, from November to May, the trades are frequently broken up by westerly winds, and then sailing-vessels can get out without difficulty.

There are but two hidden dangers in the bay, Whale and Grampus Rocks; they are both of coral formation. Whale Rock is about 100 ft. in diameter, and has 8 ft. water on it at low tide, with 18 to 25 fathoms around it. A black cask buoy has been placed 60 ft. east of the rock in 23 fathoms water. The sea breaks over the rock in bad weather, otherwise it is not easily seen. There is a clear passage of about one cable in width between the rock and Blunt Point, with from 25 to 30 fathoms water.

Grampus Rock bears N.N.E. ¾ E. from Whale Rock, about 2½ cables distant. It is about 60 ft. in diameter, and has 8 ft. of water on it at low tide. There is a narrow passage between it and the shore reef, but it should not be taken except in cases of emergency; there are from 23 to 25 fathoms of water in the channel. A red cask buoy has been placed 60 ft. to the south of the rock in 25 fathoms water.

There is a *sunken rock* N.N.W. ¾ W., about 4½ cables from Grampus Rock, but it is well marked by the surf which breaks on it continually.

A *shoal* of sand, 20 yards in extent, with 15 ft. water on it, and 5 to 9 fathoms close around lies, with the point next westward of Observation Spot N. 72° E.; west point of Fonga-Tongo Bay S. 49° E.; and northernmost large house, Pongo Pongo N. 85° W., distant 3 cables.

Wood and water can be had, the latter at Pango Pango, Fonga-Tongo, and Faugaalu. The latter is the best watering place, but it is a great distance from the usual anchorage in the inner harbour. If casks are used, they can be filled in either place, at any stage of the tide. Boats, however, cannot approach the watering places except at high water.

Fruits, such as bananas, oranges, pine-apples, cocoa-nuts, and plantains, are plentiful, and can be procured from the natives by barter. Yams, taro, and bread-fruit can be procured in small quantities. The natives have a few fowls and pigs for their own use, but not for sale; at least, we were unable to procure any from them. There are a few cattle owned by the missionaries and teachers, from whom a bullock can be procured occasionally, but this cannot be depended upon as a source of supply.

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The S.E. trades blow steadily from May to November, during which time the weather is pleasant, with occasional showers. For the remainder of the year the trades prevail, but are frequently broken up by northerly and westerly winds, and gales with heavy rain, thunder and lightning. Destructive hurricanes are experienced at intervals. In April, 1850, in January, 1870, and in March, 1883, the island was devastated by them—the cocoa-nut, banana, and bread-fruit crops were completely destroyed, reducing the natives to the verge of starvation for several weeks. In March, 1889, a hurricane of exceptional fury visited Samoa; five vessels were stranded or wrecked in Apia Harbour, and H.M.S. *Calliope* only escaped by steaming out to sea.

The tides are of the semi-diurnal type, and, considering the small rise and fall, are very regular. Mean time of high water, F. and C., at 7h. 11m.; mean rise and fall of springs, 3 ft. 4 ins.; the flood sets to westward.

The current near the coast of Tutuila, especially during N.E. winds, sets S.W.; as much as 4 knots an hour has been experienced. Between Upolu and Tutuila, from August to December, the current has been found setting N.W. about half a knot per hour.

Taema Bank, off the entrance to Pango Pango, is 3 miles long east and west, and upwards of half-a-mile wide; the western extremity bearing S. by E. from Breaker Point, is distant 1½ miles, the least water (4½ fathoms) over which the sea breaks in bad weather is on this end of the bank, and is the only danger to be avoided outside the shore reefs. Taema Bank should be avoided, even in fine weather, by vessels drawing over 12 ft.

Peiva Peak in one with, and seen over, Breaker Point N. by E. ¼ E. leads in mid-channel through the passage between Taema Bank and the reef off Deceit Point.

Nafanua Bank commences about 1½ miles northward of the eastern end of Taema Bank, and extends E.N.E. ½ E. about 3 miles to the S.W. end of Aunu Island, it is from a quarter to half-a-mile wide, and has from 5½ to 26 fathoms water on it, but the soundings are very irregular. Breaker Point, bearing W.N.W. ½ W., leads through the channel between Nafanua and Taema Banks.

A pilot can be obtained for Pango Pango.

LEONE BAY, on the S.W. side of Tutuila, is completely open to southward, and a wind from that direction would make it

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not only uncomfortable, but very dangerous; during the summer months, when the trades blow steadily, it is smooth and safe. There is considerable level country about this place, and it is the most productive portion of the island. It is covered now principally with cocoa-nut and bread-fruit trees.

There are no outlying or hidden dangers, a vessel may stand in boldly clear of the shore reefs which extend from 100 to 300 yards, and are, as usual, well marked by the surf which breaks upon them continually. The best anchorage is in from 20 to 16 fathoms, midway between Rock Point and the opposite shore.

We conclude these observations with an abstract from the last report of the British Consul at Samoa on the trade of those islands:—

"The principal article of export from Samoa is copra, of which twice as much was shipped in 1891 as in the previous year, and, as there has been no hurricane during this year's stormy season, everything looks favourable for an increase in the export of copra during 1892. Great Britain and her colonies imported into Samoa more than three times as much as any other nation—nearly two-thirds of the total imports. In a total of 60,497 tons of shipping, 20,024 tons were British, 19,182 American, and 16,878 German. Communication is now made by the ocean steamers with New Zealand in five days, and with Australia in eight days. The Consul hopes that the Samoan Government will commence a road round the island of Upolu. A rough road exists for a great part of the distance, and only requires improving. No improvement is more urgently required than a road across that island over the mountains from Apia on the north coast to Safatu or Falealili on the south coast, a distance of about 12 miles. This could be made by the natives at small cost, and would open to the trade of Apia the whole of the other side of the island of Upolu, and with a good road settlers would be able to take advantage of the cooler climate on the mountains."

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MARINE PROJECTS.

VAN OLLEFEN'S PATENT GEAR FOR WATERTIGHT DOORS.

THIS gear is adapted for vertical doors or those placed at an angle, and is said to be simple and not liable to get out of order. It consists of a small winch, which is bolted to the bulkhead in a suitable position, at a height above the load water-line. The shaft of this winch has a squared end upon which a handle or ratchet carries a pinion wheel, the teeth of this pinion engage with a rack, the lower end of which is attached to the door. On the shaft a brake pulley is loosely fitted, so that the shaft can revolve within it. This brake pulley carries a pawl and a spring pressing upon it, the pawl gearing with a ratchet wheel, which is securely keyed to the shaft. It will be seen that a brake block is adapted to press against the periphery of the brake pulley by means of a tightening screw and a hand wheel. A safety pin engages within a hole in the brake pulley, and prevents its rotation when such is desired.

In opening a watertight door fitted with this gear, the handle is placed on the end of the shaft, the brake tightened somewhat, and then the shaft is turned. The pawl remains stationary, and the brake pulley is held by the brake block, the ratchet wheel and pinion going past the pawl and the brake wheel. When the door is quite open, the brake is screwed tight and the safety pin put in place. The bearing surface of the brake wheel is provided with a series of through holes to suit the size of the pin, and should the brake by accident or carelessness be unintentionally slackened, the pin will prevent the door coming down more than a couple of inches. In lowering the door the safety pin is removed, and the wheel turned to release the brake block to such an extent as may be required to drop the door either quickly or slowly. Should the door from any cause be jammed and require to be forced down, this can be done by the ratchet used for lifting it, without danger to the man working the ratchet, as should the door suddenly drop the ratchet will also slip.

This gear is the invention of Mr. Van Ollefen, Surveyor to Lloyd's Register at Amsterdam, and has already been adopted in several steamships owned in the United Kingdom, and in a large number of Dutch steamers, including the Armoured

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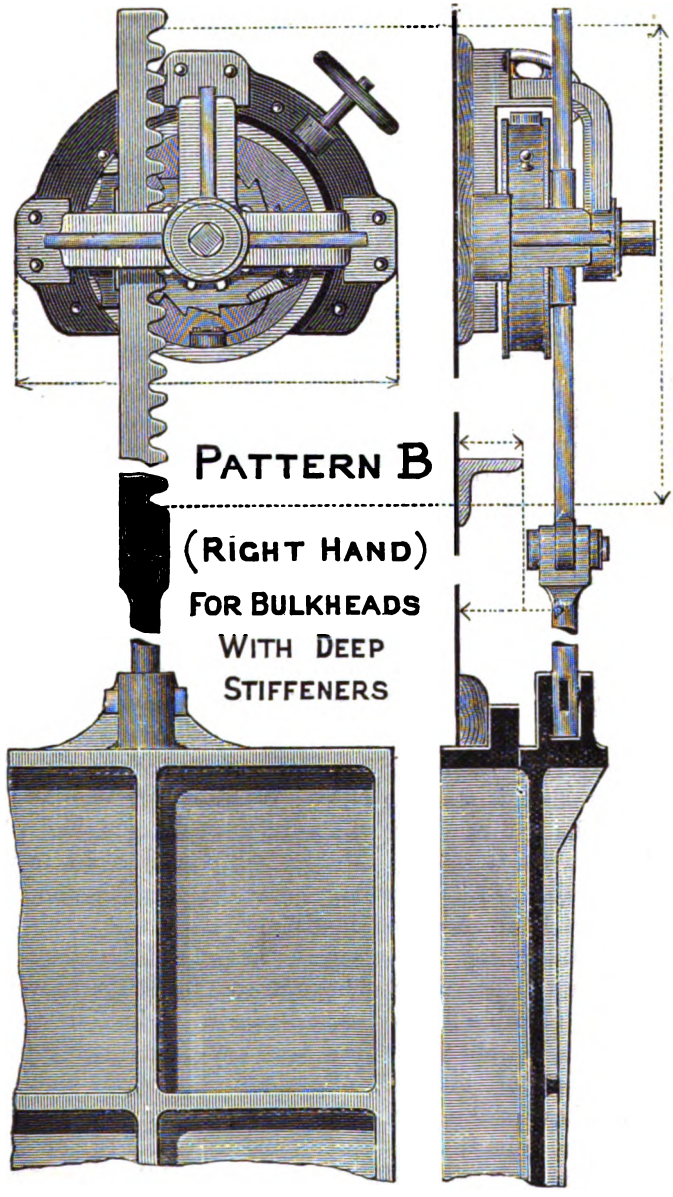
cruiser now building at Amsterdam. Messrs. John Brown & Co., Limited, Atlas Steel and Iron Works, Sheffield, are the manu-



facturers in the United Kingdom. The principal advantages claimed for this gear are that doors fitted with it can be lowered

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with complete control almost instantaneously in case of sudden emergency or at any speed, and only from above the deep load-line. Whether lowered quickly or slowly, no part of the gear becomes disconnected at any time. No part can be mislaid and therefore be wanting at the moment of need, so that the gear is always ready to act.

CORRESPONDENCE.

SHIPS' LIGHTS.

To the Editor of the "Nautical Magazine."

SIR,—A letter from "Navigator" in your July issue, advocating additional anti-collision lights, attracted my attention, but not in time to allow me to ask your leave to reply to it till now. Such letters are generally important, even when one disagrees with them, for, as Mr. John Glover has shown, collision is the one kind of wreck which we have as yet made no progress in checking. And even if one considers proposals unnecessary or harmful, yet every attempt to raise discussion must bring us nearer to discovery of real remedies.

"Navigator" proposes additional lights which will indicate at night the course steered "within three points," and I must assume—looking at his diagram—that he supposes B, as the giving-way ship, ought to act differently according as A, the holding-on ship, is steering N.W., W. by N., or W.S.W. But I think if he had made his diagram to scale, and had plotted out for B what it was actually in her power to do, to "keep out of the way of A," he would have seen that his conclusions could hardly have been sustained.

To illustrate my meaning, I have roughly reproduced "Navigator's" diagram, and have drawn for B the movements it would be possible for her to make in an endeavour to avoid collision if she kept her speed and had fair turning powers. The figures denote intervals of time, and show by comparison where the bow of the ship would be in a given time, supposing she put her helm hard a-port, hard a-starboard, or kept it steady. The lines represent the positions of the line of keel at the time named. The intervals of time would be determined by the length of the ship and her speed. Supposing them to be two seconds, we should have the bow of the ship in half a

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minute from the time the order was given where the figure 15 is, either to the right or left of the course, according to whether the helm was ordered hard a-port or hard a-starboard. Or if no order were given, it would be where the figure 15 is marked on the course.

The powers given are those of an existing ship, which have been measured and compared with those of several other ships, which have also been measured; so that we are able to say that they are fair turning powers as regards the length of the ship.

Many curious things are brought to our notice by reducing the diagram to a scale of ship's lengths. In the first place, we see that as regards A 1 and A 2, B is practically incapable of doing anything to avoid collision, and all the lights in the world carried by A, if only seen at that distance, could not save a collision if one was due.

But whether one is due or not is a question of the relative speeds of A and B. Unless A 1 has nearly twice as much speed as B, she cannot make a collision but by porting her helm. If she does this, she makes a collision certain. Any starboard helm she gives is all to the good, and even if she has more than double the speed of B, A 1 may avoid a collision by the use of starboard helm. We have here a case where "special circumstances" "render a departure from the Rules necessary in order to avoid immediate danger."

The additional lights proposed do not, therefore, affect this case. Nor would they affect it if A 1 were twice, three times, or a dozen times, as far off as she is placed in the diagram. It would then become only more and more certain that there was no risk of collision and no necessity for any movement. Alteration of speed, it may be seen, is not open to B in the very small space she has to travel before she crosses the path of A 1 and is clear of it.

In the case of B and A 2 it is evident that there is great risk of collision unless there is very great difference in the speeds of the two ships. That is, the courses of the two ships cross at a point nearly equally far ahead of each ship. "Navigator's" inference is that if B had some better indication of the course of A 2 than is given to her by the existing lights, she might be able to do something to avoid collision, which now she cannot do. The diagram shows us that this is a fallacy. If a collision is due by reason of the near equality of the speeds it will be for A 2, and not for B to avoid it.

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Probably if B does nothing at all, it is as well; though it may be seen that port helm cannot do much harm and may do a little good, while starboard helm is just as harmful as port helm is beneficial. The space is too small and the time most probably too short for B to effect any change by her speed, but if A 2 puts her helm hard a-starboard and gives the order to reverse full speed, she may, if she has fair turning powers, just avoid a collision—but it is a very close thing; collision is almost inevitable. No re-arrangement of lights would be, in this case, of the least avail. We are still in the region of "immediate danger."

If we move A 2 twice as far off—say to A 4—we have, I suppose, a nearer approach to what "Navigator" really had in his mind when he drew his diagram without considering scale. We still have "risk of collision," just as before, but with the difference that the space is great enough for B to operate in. But we cannot fail to remark that the space even now is very small. The ships are only rather over five lengths apart from bow to bow; 500 yards distant, if they were 300 ft. long. Therefore, when we begin to speak of additional lights for such a case, we can only be imagining very thick weather.

But taking the case as it is put to us, we have the inference so far that B has a choice, which an indication of A 4's course would enable her to make correctly. All she can know at present is that A 4 is crossing her bows from starboard to port at such a speed as sets up "risk of collision," and calls on her to "keep out of the way" of the ship to starboard. If B does nothing, she leaves the risk as she found it. If she puts her helm hard a-starboard, she cannot clear the course of A 4; and it depends entirely on the relative speeds whether she makes it better or worse by that movement. Observe it is not only A 4's *course*, but A 4's *speed*, which makes starboard helm dangerous.

If B puts her helm hard a-port she may not absolutely clear the path of A 4, but she will be very near it. But it is clear she will do this: she will bring the crossing point—the dangerous point—much nearer to A 4, and much farther from B than it was originally. In other words, if both ships would have arrived at the crossing point at nearly the same time, then it is certain that the fact of B's porting her helm will prevent her reaching the crossing point *until after* A 4 *has passed it.*

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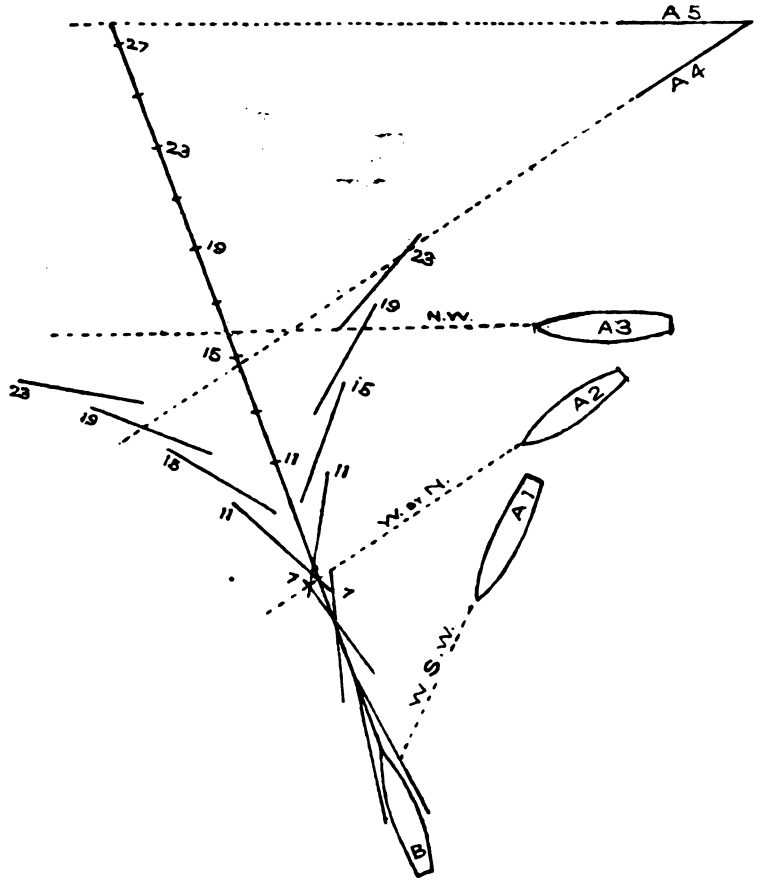
If it would originally have taken A 4 about 15 intervals of time, or 30 seconds, to have reached the crossing point, and she does nothing, it becomes quite certain that B will avoid collision by porting, even if she does not touch her speed. In this case A 4 might with difficulty make a collision by reducing her speed, and indeed scarcely in any other way; but she is safe if she lets things alone.



Then when we come to B stopping and reversing, we can see how wise it is with port helm, and how unwise with starboard helm. If she starboards, she is bound to get across the path of A 4 sooner or later. Her only chance is *sooner*, as starboard helm has put the crossing point farther from A 4. But reducing speed is making her *later* in crossing A 4's path, and so increasing the danger.

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We see then, as in a proposition of Euclid, that whether A be steering W.S.W., or W. by N., there is no choice before B in keeping out of the way. She cannot be wrong in porting her helm and reducing speed. She will certainly be wrong in starboarding her helm, and doubly wrong if she combines it with reduced speed.

Let us now take the case of A 3. Here we only have risk of collision if B's speed is considerably greater than A 3's. Now, although the distance between the ships is very small—only 350 yards if they are 300 ft. long—yet it is evident that B has the matter in her own hands. The crossing point is 16 intervals of time distant, and if B puts her helm hard a-port, even if she does not touch her speed, she will easily clear the stern of A 3. Stopping and reversing by B will only make the distance apart greater when A 3 reaches the original crossing point. Moreover, if we suppose A 3 to have fair turning powers, and to put her helm hard a-starboard in alarm, she will not increase the danger, but will reduce it. If A 3 and B have like turning powers, it is not possible for them to come into collision if A 3 puts her helm hard a-starboard, and B puts hers hard a-port at the same moment.

But it will be observed that if B puts her helm a-starboard she will clear the course of A 3 altogether, and it may fairly be asked whether if B could be told by means of additional lights that A 3 was steering N.W. and not W. by N., she would not by preference put her helm a-starboard? More than one consideration makes us give a negative answer. In the first place, if B puts her helm hard a-port and reverses her engines, nothing that A 3 can do will bring about a collision. If, however, B puts her helm a-starboard, and A 3 puts hers a-starboard, a collision is almost, if not quite, certain. Again, if A 3 were steering N.W. by W., B would make a collision almost certain by starboarding. Again if A 3 is steering to the northward of N.W., port helm for B will only be the safer. Again, we see that if the danger is "immediate," starboard helm is the only helm to save collision in the cases of A 1 and A 2, and is not unsafe helm in the case of A 3, provided B ports, it becomes undesirable to recommend helm which, while not unsafe in a special case, is highly dangerous in most cases.

But the case of B and A 3, is, as I have shown, really a case of "immediate danger." "Navigator" does not seem to contemplate such cases. We must move A 3 farther off in order to get a case which is not one of "immediate danger,"

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and where the law is free to operate. A 5 is only 600 yards from B according to the scale we are employing, and yet it is plain that B has no reason at all for using any helm but port helm, and that a very little of that will remove all possibility of danger.

I think I have demonstrated that we really do not want any additional lights in any of the cases supposed. As a matter of fact, the only reason why there has ever been controversy on these points, has been the want of experiment of knowledge of the actual movements of ships, and then of diagrams to scale illustrating the conditions.

"Navigator" has taken his illustration from lights seen by the giving-way ships about 4 points on the bow. As a fact, the mass of collisions originate with lights seen less than 4 points on the bow. Collisions begin to be infrequent when they originate with a light seen so much on the bow as 4 points, and become rare when the appearance takes place 5 or 6 or more points on the bow. Most collisions begin with lights seen, or sounds heard, three points or less on the bow. If we were to construct a diagram similar to that I have treated, for light seen two points on the bow—which is a very fatal direction—we should see that all the demonstrations I have used apply with increased cogency. We ought, then, to expect to find that very few collisions occur when the holding-on ship keeps her course, and the giving-way ship *turns towards her* in order to keep out of her way. The actual fact is that scarcely any collisions happen in this way. If the holding-on ship keeps her course, then if collision occurs it is almost always found that the giving-way ship *turned from her and reduced her speed.* If the holding-on ship does not keep her course, we rarely meet a collision where she turned towards the giving-way ship. We rarely meet a collision where each ship made, as it were, for the other, as if to ram her; but we frequently meet collisions where each ship tried, as it were, to get away from the other and give her a wide berth.

All this sounds like paradox, and is widely considered to be such. So far as can be ascertained, however, at present, it is only the simple effect of causes discoverable by such diagrams as I have given you, when they are taken on scale, and the real movements of ships are employed in discussing them.

I am, Sir,

Your obedient servant,

July 25th, 1892. P. H. COLOMB.

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THE EFFECT OF STRONG LIST ON A VESSEL'S COURSE.

To the Editor of the "Nautical Magazine."

SIR,—I think the behaviour of a vessel with a strong list is not so well understood as it might be, and possibly may be the cause of *strandings and courses not made good*, which cannot be accounted for by heeling error, &c.

In the case of a steamer, say, with a list to port, the action of the water on that bow (being more submerged than the starboard-bow) shoves the vessel's head over to starboard. To counteract this the *rudder* must be kept continually over to port; the result of these two forces is to drive the vessel in an opposite direction from the list, which, I think, cannot be less than one mile in a lateral direction for every ten miles a-head.

This lateral action might be calculated according to the amount of list and speed of vessel. Hoping I have made myself understood,

I remain, Sir, yours respectfully,

WM. LAX, Officer Mercantile Marine.

32, Grey Street, North Shields, August 15th, 1892.

PORTABLE RAPID ROCK DRILLS ON HIGH CLIFFS IN THE RESCUE OF THE DROWNING.

To the Editor of the "Nautical Magazine."

SIR,—Whatever form of life-saving apparatus is to be employed for the rescue of the drowning, in those special cases where the rescuers are placed upon high cliffs above, perhaps the basis or hold of the most rapid, satisfactory and portable apparatus will be something after the present style of the Board of Trade's pointed iron staves or pins, which, in certain soils and soft rocks, can, with a sledge-hammer, be quickly inserted into the earth, and to which pins the derrick-cranes or rope-ladders will be attached or made fast.

In those cases where the fixed points have to be made immediately in very hard rocks, these pointed iron staves are practically useless. Hence, I suggest their substitution by some portable, rapid, simple and easily hand-worked rock-drills which an ordinary coastguard or chance labourer could readily apply.

On public grounds I should be much indebted for suggestions and references as to the most efficient and economical means

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to provide for such a portable apparatus with a view to decrease our augmenting and alarming annual mortality bills from drowning fatalities.

I am, Sir, yours, &c.,

J. LAURENCE HAMILTON, M.R.C.S.,
Late Honorary President Fishermen's Federation.

30, Sussex Square, Brighton, August, 1892.

TRANSPORT OF PETROLEUM THROUGH THE SUEZ CANAL.

To the Editor of the "Nautical Magazine."

SIR,—In answer to the letter of G. A. L. (a well-known and respected signature, by the way), permit me to point out that because the "practical" man may not see any analogy between cotton, dynamite or gunpowder and petroleum, that does not say that no analogy exists. Let us clear our minds of the cant which attaches to the "practical" man. The analogy between these substances consists in these facts, that under slightly varying conditions they are all inflammable, and, with the exception of cotton, explosive. They all demand special means for transportation and handling, although the cotton, in spite of fire after fire, is still treated as though it was a perfectly harmless article. All these substances in the hands of the trained and intelligent shipmaster (not a "practical" man) are as safe as tea or sugar. Why will people continually hurl the *Wildflower* case at one? Surely G. A. L. must know that the oil in that vessel was crude petroleum. Shipowners engaged in the bulk-oil trade have not regarded it as being an especially dangerous one, nor as one demanding any special knowledge on the part of the commanders or officers. How far my contention is true your readers probably can form a better opinion than I can give. As for the oil absorption theory, I would refer G. A. L. to any "practical" oil-well sinker as to the efficacy of sand in quenching a fire. My suggestion that the Suez Canal would be a more proper scene for a fire than, say New York, is, I submit, a valid one, because in the summer time New York is hotter than Port Said, or Suez, or Ismailia. The floating property at New York is more valuable, or as valuable, as that on the Suez Canal. Most of the constructions on the river ports at New York are of wood. Since crude and refined oil is shipped in bulk from New York with the thermometer, say, at 110° as it often is, and no great

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danger has resulted, does it not follow that refined oil could be equally safe in the Suez Canal?

As for the danger resulting from collision, this could be largely minimised by adoption of proper precautions of a constructive and administrative character. It seems to me to indicate a sad want of enterprise and backbone when we see a multitude of intelligent shipowners afraid to tackle the new trade themselves, yet annoyed because foreigners are taking it up. The trade in bulk petroleum is destined to rival that of coal and grain; those who have the foresight to establish themselves in it now will, in a few years, reap the reward of energy and enterprise.

Yours, &c.,

GEO. H. LITTLE.

BOOKS RECEIVED.

General Chart of the North Atlantic. *No.* 1308. Hydrographic Office, Washington. May, 1892.

THIS chart gives a bird's-eye view of the surface currents, the best seasonal sailing routes to and from the Equator, the steamship routes between New York and Boston and Europe, the tri-monthly limits of the trade winds, the average limits of equatorial rains, variation, and other items of importance to navigators between the Equator and the 60th parallel of north latitude.

The Navigation of the Caribbean Sea and Gulf of Mexico, the West India Islands, including the Bermuda Islands and the Bahama Banks. Vol. 1. Third Edition. 1892. Washington.

THIS is an old friend under a new form; it is No. 86 of the publications of the United States Hydrographic Office, to the first and second editions of which we called special attention. The present edition has been compiled by Mr. R. C. Ray, United States Navy. As before, and in all United States nautical works, the bearings, courses, and trend of the land are true; but for convenience the corresponding magnetic bearings, to the nearest degree, follow in brackets. The preface gives the source of information whence the sailing directions have been compiled; an index chart and accompanying catalogue give the harbour and special charts of the

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West Indies, published by the United States Hydrographic Office; and a very full general index indicates the places, harbours, rocks, shoals, &c., described in the body of the work. Chapter I.: "Remarks on winds, hurricanes, earthquakes, currents, Gulf Stream, and usual routes for steamers and sailing-vessels," is concise and invaluable; in fact, just what the navigator requires.

List of Lights and Fog-Signals on the Atlantic and Gulf Coasts of the United States. Corrected to January 1, 1892. Washington.

List of Lights and Fog-Signals on the Pacific Coast of the United States, and on the Coast of British Columbia. Corrected to January 1, 1892. Washington.

OUR opinion on the excellence of the arrangement of these Light Lists has been frequently given. We have now to add that to the usual descriptive letterpress, sketches from seaward of the appearance of the principal lighthouses and light-vessels are furnished to aid in the recognition of the locality.

Annales Hydrographiques: 2e série, 1er Volume, de 1892. Paris.

THIS work is generally a selection of documents and memoires relating to hydrography and navigation, published by the French Hydrographic Office. The volumes of the series contain, from time to time, articles of considerable importance, and there are several in the number before us which call for special attention. The observations by M. A. Dormoy, of the pilotage department, on certain peculiarities in the tides of the river Seine are very interesting. M. J. Réveille has a valuable note on a graphic representation of the daily rate of a chronometer. M. A. Schwerer discusses the subject of terrestrial magnetism in relation to the island of Newfoundland and its vicinity. M. Leconte de Roujou gives the magnetic elements for the China Sea, China, Japan, the Corea, and Siberia. Lastly, we find an important paper on a graphic method of determining the position of a ship at sea; the principles are fully described, and numerous diagrams are given illustrating the text; the graphic method of solving mathematical and nautical problems is upwards of 250 years old, but it fell gradually into disuse; within the last few years, however, there has been a desire to revive the methods, and to this subject we shall shortly return.

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THE ROYAL NAVAL RESERVE.

The Gazettes.

Admiralty, August 2nd.

The following Sub-Lieutenants to be Lieutenants:—W. N. Young, T. F. Tippett, O. P. Marshall, F. S. Lamont, C. S. Cassidy, R. P. Graham (all dated July 1st, 1892).

Appointments.

Lieutenants: R. R. Hubbard to *Benbow* (to date July 19th); E. J. Laming (acting) to *Conqueror;* H. W. Bennett to *Shannon* (both to date July 21st); W. Hazell (acting) to *Nelson* (additional); C. A. Mossman to *Forth* (both to date July 22nd); W. H. Owen to *Inflexible;* W. J. Fraser (acting) to *Amphion;* Irvin Hayward (acting) to *Hecla;* H. N. Dewhirst (acting) to *Mercury;* C. F. Hart (acting) to *Sans Pareil* (all to date August 15th); T. D. Tod (acting) to *Royal Sovereign* (additional for disposal, to date August 15th); J. B. Groom to *Dreadnought* for twelve months' training (to date August 6th).

Sub-Lieutenant: J. W. McKenzie (acting) to *Victoria* (additional, to date July 21st).

The Queen has been pleased to grant Vice-Admiral Sir George Tryon, K.C.B., Commander-in-Chief on the Mediterranean Station, Her Majesty's Royal license and authority that he may accept and wear the Insignia of the Order of the Medjidieh of the First Class, which the Sultan of Turkey has been pleased to confer upon him as a promotion in that Order.

With the ceremony of the prize distribution on board the *Worcester* on the 29th July last, terminated the command of Captain John Henderson Smith, R.N.R., who has appropriately been designated the "Commodore of training-ships." Captain Smith has commanded the *Worcester* for the long period of twenty-five years, and during that time some 3,000 cadets have passed through his hands, many of whom are now commanding fine ships, and are officers in the Royal Naval Reserve. At the close of the proceedings Captain Smith was presented by the Committee of the *Worcester* with a silver goblet and a purse of sovereigns; also with a silver tea-tray and service from the "Old Boys." Similar presentations were

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made on behalf of the officers and masters and the cadets. The following is the "Old Boys'" address :—

"To CAPTAIN JOHN HENDERSON SMITH, COMMANDER IN THE ROYAL NAVAL RESERVE, AND MRS. SMITH, H.M.S. *Worcester*.

"We, the undersigned 'Old Boys,' who have been connected with the *Worcester* during your command in the course of the last 25 years, desire to express our hearty feelings towards you, on the occasion of your leaving the old ship, at the close of so long a period.

"Your united kindness and interest in our general welfare, while cadets on board, and since, has ever been manifested, and your friendship will long be remembered—never to be forgotten by us all.

"We are deeply sensible of the loss you will be to the old ship and its connections, but though severed from it, we hope and trust you may long be spared to continue to take a lively interest in our well-being, and that we may often have the opportunity of having you amongst us.

"We shall feel honoured if you, Sir, now that you are an 'Old Worcester,' will become the first Honorary President of our 'Old Boys' Association,' which has now been established six years under your auspices, and we expect will be a bond of great usefulness, sociability and friendship under your leadership.

"We believe the 25 years you have commanded the old ship has been a time of *great influence for good;* the fruit of which will be seen in years to come in the *Marine Service of the British Empire.*

"These expressions of gratitude, felt by many of our parents, as well as ourselves, we testify by the gift of the accompanying silver tea-tray and service, in token of our highest esteem and ardent affection.

"We pray our GOD may grant you both many years of health and happiness in the enjoyment of your retirement, and that you may see some result of your labours."

(Names of 200 subscribers follow in alphabetical order by their year.)

We heartily echo the wish contained in the last paragraph of the address that Captain Smith may be granted many years of health and happiness in the enjoyment of his retirement.

LIEUT. C. H. Watkins, who distinguished himself on the night of the *Utopia* disaster, writes—"I thank you for the kindly interest taken on my behalf in your paper, and have much pleasure in informing you that the Italian medal for saving life in the *Utopia* disaster has been forwarded to me." Our hearty congratulation to you, Lieutenant Watkins, on this well-deserved honour at the hands of the King of Italy.

THE *Canada* and the *Tourmaline*, on both of which Naval Reserve officers are serving, will return to England from the

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North America and West Indies station later on in the year to be recommissioned, and will return at once to the same station.

THE following notes from an account of the cruise of the *Cleopatra* on the south-east coast of America are interesting. Lieut. Thos. D. Tod was appointed to this ship in November, 1891, and was transferred to the *Swiftsure* on her return to England at the end of her commission in July last.

"Captain Musgrave, who was much respected by his crew, was invalided home early in January, 1891, and his death soon afterwards took place, to the regret of all who knew him. The command was then assumed by Captain Humpage, of the *Beagle*, who acted as senior officer on the station until the arrival of Captain Lang, who had previously held a high post in the Chinese Navy. In November of the same year Lieut. John Russell Oldnall met his death, under circumstances recorded at the time. He was a very popular officer, and universal regret was felt at his death. In February, 1892, the *Cleopatra* was sent in search of shipwrecked crews, and on nearing the island of St. John's a signal of distress was observed to be flying. A boat was sent in, and 29 persons were taken off. This shipwrecked crew had belonged to a vessel named the *Crown of Italy*, and the captain's wife and daughter were amongst the survivors. They had undergone horrible suffering, having been on the island for eighty days without any food but shell-fish for the greater portion of the time. Their wants were attended to on board the *Cleopatra*, but it is worthy of note that the officers and men had to supplement the Government rations, as only three-quarters of the usual allowance of provisions is permitted to shipwrecked passengers by Admiralty regulations. Another wrecked crew was transferred to the *Cleopatra* from a steamer at Port Stanley. This was the crew of the *Viscount*, of Liverpool, numbering 21 hands, and the blue-jackets paid them every attention, and supplied them with clothing from the canteen. While taking these men to Monte Video the *Cleopatra* put in at Nuevo Gulf, and here three of the officers started for a walk to Chenput. Lieut. Hugh S. White, who was one of the number, had a severe sunstroke, from the effects of which he died almost immediately. He was buried next day at Chenput. This is a record of accidents, but the commission of the *Cleopatra* has been a happy one, and officers and men seem to have pulled well together throughout. The ship was relieved by the *Sirius* at Monte Video on May 21st last, and reached Plymouth on the 11th inst., after an absence from England of three and a half years."

THE controversy about the granting of the decoration for long service to the Militia waxes strong in the columns of our Service contemporaries, and as the demand for the decoration on the part of the Militia seems almost unanimous, which

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means, of course, a mere question of time as to its being granted, we append a copy of the recently-issued warrant, which will be handy for reference should the question of its being granted to the Royal Naval Reserve crop up later on :—

"THE VOLUNTEER OFFICERS' DECORATION WARRANT.

"VICTORIA, R.

"Victoria, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, to all to whom these presents shall come, Greeting!

"Whereas it is Our Royal desire to reward the long and meritorious services of Officers of proved capacity in Our Volunteer Force; Now for the purpose of attaining this end, We have instituted, constituted and created, and by these presents for Us, Our Heirs and Successors, do institute, constitute and create a new Declaration which We are desirous should be highly prized by the Officers of Our Volunteer Force; and We are graciously pleased to make, ordain and establish the following rules and ordinances for the government of the same, which shall from henceforth be observed and kept :—

"Firstly. It is Ordained that the Decoration shall be styled and designated 'The Volunteer Officers' Decoration,' and shall consist of an Oak Wreath in silver tied with gold, having in the centre the Royal Cipher and Crown in gold.

"Secondly. It is ordained that the Decoration shall be suspended from the left breast by a green riband of one inch and a half in width from a silver Oak bar-brooch.

"Thirdly. It is ordained that the Decoration may be worn by Us, Our Heirs and Successors, Kings and Queens Regnant of the United Kingdom of Great Britain and Ireland; and it shall be competent for Us, Our Heirs and Successors, to confer the Decoration upon any of the Princes of the Royal Family of Great Britain and Ireland.

"Fourthly. It is ordained that no person shall be eligible for this Decoration nor be nominated thereto unless he is or was a Commissioned Officer and has served twenty years in Our Volunteer Force, is recommended by the Commanding Officer of the Corps in which he has served, and is duly certified by the District Military authorities in which the Corps is located, as having been an efficient and thoroughly capable Officer, in every way deserving of such a decoration; Provided nevertheless and We do hereby declare that half of any time during which an Officer of Our Volunteer Force may have served in the ranks of Our said Force shall reckon as qualifying service towards the twenty years required as aforesaid.

"Fifthly. It is ordained that the names of those upon whom We may be pleased to confer the Decoration shall be published in the *London Gazette*, and a registry thereof kept in the office of our Principal Secretary of State for War.

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"Sixthly. In order to make such additional provision as shall effectually preserve pure this most honourable distinction, it is ordained, that if any person on whom it shall be conferred be convicted of any act derogatory to his honour as an Officer and gentleman, his name shall forthwith be erased from the registry of individuals upon whom the said Decoration shall have been conferred, by an Order from Us under Our Royal Sign Manual; and a notification thereof shall be duly published in the *London Gazette*.

"Lastly. We reserve to Ourselves, Our Heirs and Successors, full power of annulling, altering, abrogating, augmenting, interpreting, or dispensing with these regulations, or any part thereof, by a Notification under Our Royal Sign Manual.

"Given at Our Court at Osborne, the twenty-fifth day of July, in the fifty-sixth year of Our Reign, and in the year of Our Lord one thousand eight hundred and ninety-two.

"By Her Majesty's Command,

"EDWARD STANHOPE."

WE published in last month's issue a letter from "A. J. B.," complaining of the treatment of Royal Naval Reserve officers on board drill-ships. Commenting on this, the *Admiralty and Horse Guards Gazette* says:—

"This state of affairs is, palpably, undignified and detrimental to discipline. The same correspondent asserts that the Reserve men under instruction are not by any means as respectful as they should be, or as they would be in the Merchant Service, a circumstance which he puts down to the familiarity of the instructors. Another thing that this correspondent thinks ought to be suppressed, is the 'tipping' of the junior instructors, which, he asserts, is getting a nuisance, as it has grown into a regular custom. If these statements are not exaggerated, there certainly appears to be room for improvement in the internal economy of the drill-ships. Officers should drill by themselves, discipline be enforced, and 'tipping' be not only discouraged, but the recipient of the 'tip' severely punished."

This is the only way to get these abuses ended. When they are thoroughly exposed and ventilated through the columns of the Service press, the Admiralty cannot ignore their existence. Should they show any disinclination to move in the matter, the Reserve should be prepared to have the attention of Parliament directed to these grievances through their representatives in the House.

THE *Frolic*, which was moored for some years alongside the Thames Embankment opposite Somerset House, as head-quarters of the London Brigade R.N.A.V., is now about to be

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put to a more useful purpose than the manufacture of dry-land sailors. She is to be converted into a coastguard watch-vessel for service on the Roach river at Burnham. It is a wonder that the defunct R.N.A.V. did not purchase her and convert her into a privateer or something of that sort, for occasionally entertaining their friends with an open-air performance of "Paul Jones the Pirate."

Apropos here are the regulations recently issued under which companies of men belonging to the late corps can be added to the Militia and Volunteer Divisions, Royal Engineers (sub-marine miners) in separate companies with their own officers.

"1. The following are the additions to the existing establishments at the different ports:—(*a*) Clyde, 156 men; (*b*) Mersey, 208 men; (*c*) Severn, 156 men; (*d*) Thames (Militia), 156 men. 2. These additional companies will be kept distinct, and employed in special duties, chiefly in connection with the boat defence of the ports concerned. They will form part of the same organisation and be subject to the rules and regulations of the corps they join. They will receive the same capitation allowance, &c., and put in the same number of drills and length of training as are already put down for the sub-marine mining divisions they join."

They are kindly permitted by the Admiralty to wear out their theatrical costumes, but these "properties" are not to be renewed. After that they must don the uniform worn by sub-marine miners.

It has not been found possible to utilise the services of members of the Southport, Llandudno, Carnarvon, Brighton, Hastings, or Yarmouth Corps, except in so far as they may be willing to amalgamate with the existing organisations of those places.

TOUCHING these regulations, one of the *soi-disant* blue-jackets, writing under the pseudonyme of "Wide Trousers," unbosoms himself in a service contemporary, and protests that they "will not be hooked to become *bottle-washers* to the sub-marine miners." This is surely an infelicitous expression to use under the circumstances, and rather hard on his shipmates in the ginger-beer manufacturing line. "Wide Trousers" goes on in a "Rule Britannia" strain to make the following declaration:—

"No, the members of the R.N.A.V. cannot forget they were hardly dealt with, and even the temptation to wear their old uniforms for a short period will not be sufficient to induce them to enrol themselves again in

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the volunteer forces of the country. There is still, however, an important matter to settle in connection with the old corps which is of more interest to the men than any new scheme of service. I mean the much talked of compensation, of which I have not heard anything since the disbandment. I trust the day is not far ahead when each man will be paid his due, and I am certain the worthy officers who steered the brigades against strong Admiralty head-winds will not be found wanting in pressing our claim."

Evidently the wearing of "wide trousers" is conducive to the acquirement of a correct nautical style of speech.

M. WEYL, in the *Yacht*, indulges in some fulsome laudation of Lord George Hamilton, who, he thinks, "has given to the English sea service an impulse so admirable that even during the election, which has been fatal to his party, his adversaries have done justice to his administration." Possibly M. Weyl has gathered his information about Lord George and his doings from some of the latter's own electioneering panegyrics, but we know more about Lord George than even M. Weyl does, and have no hesitation in saying that there are few in the rank and file of the Conservative party who could not have discharged the duties of First Lord equally as well, and fewer still who would have committed such an egregious blunder as his Lordship has done in his treatment of the Royal Naval Reserve. We trust that the removal of the slur that has been cast on the Reserve by his predecessor, will be one of the first duties taken in hand by the new First Lord.

A SERVICE contemporary, in referring to the celebrated Hearson case, remarks on the fact that that gentleman's name is still retained on the active list of the Navy, and expresses the opinion that this is an extraordinary proceeding on the part of the Admiralty, unless indeed the omission to remove his name is an error on the part of the editor of the Navy List. We are inclined to think that the latter surmise is correct, for the official Royal Navy List is by no means free from imperfections. Some time ago we directed the editor's attention to the fact that in the list of honorary lieutenants of the Royal Naval Reserve, Lord Iveagh still appeared as Sir Edward Cecil Guinness. Since then the List for the July quarter has been issued, but "Sir Edward" is still there. Perhaps nothing

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short of a correction from Lord Iveagh himself will suffice to put the worthy editor right.

THE *United Service Gazette*, commenting on the fact that the *Jumna* trooper has been laid up at Portsmouth so long because the Indian Government is unwilling to pay for her refit, thinks that the new Admiralty will have to decide with the India Office whether the Indian troop-ships are still to be manned and managed by the Royal Navy, or by the Indian Marine, or the Mercantile Marine, or whether our troops in future are to be conveyed backwards and forwards to India in hired transports of the Mercantile Marine.

WE have had numerous inquiries for the outfitters' estimates for uniform which we promised some considerable time ago, so here they are at last. The provincial outfitter, be it understood, is a first-rate tailor, who has had considerable experience in making naval uniforms. His estimate is based on twelve months' credit. The other is one of the leading naval and military tailors in London. His terms are cash, or approved references.

	London. £ s. d.	Provincial. £ s. d.
Superfine blue full dress coat, silk lined, laced with best wire lace ...	12 10 0	8 17 6
Ditto, dress coat	8 8 0	6 10 0
Full dress trousers	4 10 0	3 10 0
Dress trousers	2 0 0	1 15 0
Cocked hat with gold loops	3 10 0	3 3 0
Pair of best gold bullion epaulettes ...	7 15 0	7 10 0
Best town-made sword with proved blade	4 0 0	2 17 6
Gold sword knot	0 16 0	0 12 6
Embroidered full dress belt	3 0 0	2 17 6
	£46 9 0	£37 13 0

THE modest difference of £8 16s. in the price of the few articles included in the two lists, is strong evidence that our suggestion, that some scheme should be adopted for the protection of officers frcm the exorbitant charges of outfitters, is absolutely necessary. Moreover, we think some assistance should be given to newly-appointed officers in the matter of

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procuring the regulation uniform, who do not enjoy the same advantages in this respect as naval officers do. The chapter on uniform in the Regulations relating to officers in the Royal Naval Reserve is too meagre, and it is not possible for everyone to procure and study a Navy List at a minute's notice. A case in point was recently brought under our notice in which a youngster, appointed as a midshipman, gave the order for his outfit to the family tailor in one of the outports, whose ideas on naval uniforms were probably not very distinct, with the result that various nondescript articles of dress were supplied to him at a high price, which, to judge from the description of them, were more suitable for the get-up of a Horse Marine than an officer of the Royal Naval Reserve.

WHAT should be done is this—the Admiralty, through the Board of Trade, should supply to the superintendents of Mercantile Marine offices detailed descriptions and drawn patterns of each article of uniform. These patterns should be kept at all the principal offices, and when an officer receives his appointment he should be directed to apply to the nearest Mercantile Marine office for information about uniform. It rests, then, with the officers themselves to adopt some such plan, as we previously proposed, of appointing one good tradesman at each port to be the recognised outfitter for the Service, provided that he supplies every article of the best quality, and at a uniform price, to be settled beforehand.

RECENTLY in the House of Commons, in answer to Colonel Sandys, Lord G. Hamilton said: "The uniform which has been finally approved for the Royal Naval Reserve consists of one blue jumper (serge), two flannels, two collars, one black silk handkerchief, one pair blue tartan trousers, one cap and riband. Until arrangements have been made for supplying this uniform, the present uniform will continue to be issued. It is not intended to supply the so-called jersey uniform. The cost of the approved new uniform will be about 2s. 8d. per man more than the present uniform in use." The *Daily Graphic's* Naval "young man" has had a bad quarter of an hour with the Service papers over the head of this question and answer. To his feeble mind at once appeared an apparition of a Naval Reserve man, arrayed in all the glories of Scotch plaid, and he ventured the silly suggestion that they might as well at once be put into kilts! "This," says a contemporary, "proves con-

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clusively that he knows nothing about the internal life of the Royal Navy, where ready-made trousers of tartan—a material like serge, but stronger—have long been supplied for the use of the Marines." Another contemporary endeavours to show that in the seventeenth century seamen actually did wear kilts of Scotch plaid, but as its argument is based on the frontispiece to a pamphlet published in 1673, we are afraid there is not much in it. Perhaps Professor Laughton could tell us.

SERVICE CORRESPONDENCE.

LETTERS TO THE EDITOR.

[*The Editor desires it to be distinctly understood that he does not hold himself responsible for the opinions expressed by correspondents.*]

HAYWARD'S SIGNAL CODE.

SIR,—Being a constant reader of your valuable magazine, I have noticed several letters in the last six months relating to a signal code for use on board ships of the Mercantile Marine, winding up with the letter on "Hayward's Code of Flashing Signals" in your May issue.

Without doubt it is necessary and most important that a proper means of communication should be established, but why rack our brains to invent a new code when we have already a very efficient and simple one in the "Morse Code"?

I do not mean to disparage for one moment "Hayward's Code," but I should like to be allowed to show that the "Morse" has many advantages over it. In the first place, by it you can signal *any word* independently of the "Commercial Code," which itself is far from perfect, and, I believe, is shortly to undergo considerable alterations.

Secondly, you can signal with *anything*, by day, night, or in a fog, with flags, lamp, or whistle. And last, but not least, as it is in constant use on board H.M.'s ships, you have a ready means of communication with them, which, in time of war, would, and will, be probably, of vital importance. A great many R.N.R.'s who have served in the Royal Navy, whom I could mention, already know it, and frequently use it when passing each other in the Red Sea, &c.

With the "Morse Code" you can signal at any military station, such as Gibraltar, Malta, Perim, &c., which might, on occasion, be of advantage to the merchant steamer.

I hope the time is not far distant when the Board of Trade will make a knowledge of the "Morse Code" a *sine quâ non*

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to obtaining a mate or second mate's certificate, and I believe it would be an advantage to all concerned. The different letters of the "Morse Code" can be found by referring to "Bedford's Sailor's Pocket Book," an edition of which most sailors own. I enclose my card, and beg you will allow me to take part in any scheme which is got up to protest against the seniority of the "Indian Marine" over the Royal Naval Reserve.

With apologies for trespassing on your space,

I remain, &c.,

A Sub-Lieut. R.N.R.

Port Said, August 1st, 1892.

[No apologies necessary. We only wish your brother officers were not quite so chary of their ink and paper where the interests of the Royal Naval Reserve are concerned.—Ed. *N. M.*]

NOTICES TO CORRESPONDENTS.

"To Kalon."—Communications to be inserted in the *Nautical Magazine* must be written on one side of the paper only, written legibly, and must be concise and to the point. Your communication of the 20th ult. complies with the first of these requirements only, and we regret we cannot find space for it, nor could we be responsible for the result if it were put in the printer's hands, the erasures and additions are so numerous.

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO AUGUST 6TH.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Agamemnon ...	6	380	D.S. Bat.-ship, 1st cl.	Capt. C. Johnstone	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	D.S. Bat.-ship, 1st cl.	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Australia ...	12	461	D.S. Cruiser, 1st class	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Bellona ...	6	168	D.S. Cruiser, 3rd class	Comm. H. D. Barry	May 14, 1892, Devonport	Channel Squadron.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Collingwood ...	10	420	D.S. Bat.-ship, 1st cl.	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	... ... Malta ...	Mediterranean.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Hecla	6	272	Torpedo Depôt-ship	Capt. Durnford, D.S.O. ...	Nov. 6, 1888, Portsmouth	Particular Service.
Howe	10	523	D.S. Bat.-ship, 1st cl.	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5,'89, Hong Kong	China.
Mercury ...	13	280	D.S. Cruiser, 2nd class	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Nelson	16	322	D.S. Cruiser, 1st class	Capt. Woodward, C.B. ...	Oct. 1, 1891, Portsmouth	Portsmouth.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Pylades ...	14	161	S. Cruiser, 3rd class	Comm. J. B. Young	Re-c. Nov. 13, '89, Bermuda	N. America and W. Indies.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	...	D.S. Bat.-ship, 1st cl.	Capt. Tynte F. Hammill, C.B.	... ...	Channel Squadron.
Sans Pareil ...	15	583	D.S. Bat.-ship, 1st cl.	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	D.S. Cruiser, 2nd class	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Trafalgar ...	10	550	D.S. Bat.-ship, 1st cl.	Capt. G. C. Robinson ... (R.-Ad. A. H. Markham.)	April 2, 1890, Portsmouth	Mediterranean.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.
Victoria ...	15	587	D.S. Bat.-ship, 1st cl.	Capt. Hon. M. A. Bourke ... (V.-Ad. Sir G. Tryon, K.C.B.)	Re-c. Ap. 29, 1890, Malta	Mediterranean.

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TIDE TABLES FOR SEPTEMBER, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields.		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown.		Kingstown.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
W	1	7 57	8 34	0 26	1 3	10 4	10 46	8 57	9 39	11 30	—	5 8	5 45	0 19	1 0	5 21	6 6	5 59	6 41	11 26	—	5 24	6 3	2 41	3 21	10 24	11 9
T	2	9 17	10 3	1 42	2 22	11 28	—	10 21	11 2	0 11	0 55	6 25	7 8	1 44	2 30	6 52	7 36	7 24	8 7	0 10	0 54	6 43	7 23	3 59	4 35	11 55	—
F	3	10 50	11 33	8 2	3 41	0 10	0 47	11 40	—	1 40	2 24	7 50	8 27	3 13	3 54	8 16	8 51	8 48	9 25	1 37	2 16	8 1	8 36	5 7	5 35	0 36	1 12
S	4	—	0 7	4 16	4 46	1 19	1 46	0 13	0 40	3 8	3 48	8 58	9 25	4 31	5 2	9 19	9 43	9 56	10 23	2 48	3 16	9 8	9 36	6 0	6 23	1 43	2 8
S	5	0 36	1 0	5 10	5 32	2 9	2 30	1 3	1 25	4 14	4 39	9 50	10 18	5 30	5 55	10 5	10 26	10 47	11 10	3 41	4 4	10 0	10 19	6 46	7 8	2 31	2 52
M	6	1 23	1 45	5 53	6 14	2 50	3 10	1 47	2 8	5 3	5 26	10 36	10 58	6 18	6 40	10 47	11 8	11 33	11 55	4 26	4 47	10 38	10 57	7 30	7 50	3 13	3 33
T	7	2 4	2 24	6 35	6 56	3 29	3 48	2 28	2 46	5 48	6 10	11 20	11 42	7 2	7 23	11 28	11 48	—	0 16	5 8	5 29	11 16	11 35	8 9	8 27	3 53	4 13
W	8	2 42	3 2	7 16	7 36	4 7	4 26	3 4	3 22	6 31	6 51	—	0 3	7 42	8 0	—	0 7	0 36	0 56	5 49	6 8	11 55	—	8 44	9 2	4 32	4 50
T	9	3 21	3 40	7 55	8 14	4 46	5 6	3 41	4 1	7 11	7 30	0 23	0 44	8 18	8 37	0 26	0 45	1 16	1 35	6 27	6 47	0 15	0 35	9 20	9 38	5 9	5 28
F	10	4 1	4 21	8 33	8 53	5 26	5 47	4 21	4 42	7 49	8 8	1 5	1 27	8 56	9 15	1 4	1 24	1 54	2 14	7 7	7 27	0 55	1 16	9 57	10 17	5 48	6 8
S	11	4 42	5 2	9 14	9 35	6 9	6 31	5 3	5 25	8 27	8 47	1 49	2 11	9 34	9 53	1 44	2 4	2 35	2 56	7 47	8 7	1 38	2 0	10 38	11 1	6 29	6 50
S	12	5 22	5 43	9 56	10 19	6 53	7 16	5 48	6 18	9 7	9 28	2 33	2 55	10 12	10 31	2 25	2 47	3 17	3 38	8 28	8 50	2 22	2 46	11 39	—	7 13	7 33
M	13	6 6	6 30	10 46	11 18	7 48	8 14	6 40	7 11	9 50	10 14	3 18	3 43	10 51	11 18	3 11	3 30	4 1	4 27	9 14	9 43	3 12	3 41	0 2	0 40	8 6	8 37
T	14	6 57	7 29	11 56	—	8 51	9 34	7 47	8 28	10 40	11 12	4 12	4 45	11 52	—	4 12	4 52	4 57	5 33	10 18	11 1	4 16	4 56	1 24	2 11	9 14	9 58
W	15	8 6	8 52	0 36	1 19	10 21	11 9	9 15	10 3	11 56	—	5 23	6 6	0 35	1 25	5 39	6 31	6 16	7 5	11 51	—	5 39	6 24	2 58	3 43	10 48	11 30
T	16	9 44	10 35	2 4	2 48	11 55	—	10 48	11 29	0 44	1 30	6 58	7 40	2 15	3 1	7 21	8 6	7 58	8 37	0 39	1 25	7 8	7 50	4 24	5 0	—	0 25
S	17	11 18	11 57	3 30	4 8	0 36	1 11	—	0 4	2 16	3 0	8 20	8 52	3 45	4 23	8 48	9 12	9 16	9 49	2 6	2 41	8 28	9 1	5 29	5 53	1 4	1 36
S	18	—	0 28	4 39	5 3	1 39	2 2	0 33	0 56	3 37	4 5	9 18	9 41	4 55	5 21	9 36	9 57	10 16	10 38	3 9	3 32	9 29	9 52	6 16	6 38	2 1	2 23
M	19	0 52	1 15	5 24	5 48	2 23	2 42	1 18	1 38	4 27	4 49	10 3	10 24	5 44	6 5	10 16	10 35	11 0	11 20	3 54	4 14	10 11	10 27	6 59	7 18	2 42	3 0
T	20	1 36	1 54	6 2	6 20	2 59	3 15	1 56	2 18	5 10	5 28	10 43	11 1	6 25	6 43	10 52	11 8	11 39	11 56	4 32	4 49	10 48	10 58	7 35	7 51	3 17	3 33
W	21	2 10	2 25	6 37	6 53	3 31	3 45	2 28	2 43	5 45	6 1	11 18	11 34	7 0	7 15	11 24	11 40	—	0 12	5 6	5 22	11 13	11 28	8 6	8 20	3 49	4 5
T	22	2 40	2 55	7 8	7 23	4 0	4 15	2 57	3 11	6 17	6 33	11 50	—	7 30	7 44	11 55	—	0 28	0 44	5 37	5 52	11 43	11 58	8 34	8 47	4 20	4 34
F	23	3 9	3 24	7 38	7 53	4 30	4 45	3 25	3 40	6 47	6 59	0 6	0 22	7 58	8 12	0 10	0 25	0 59	1 14	6 7	6 21	—	0 13	9 0	9 13	4 48	5 2
S	24	3 39	3 54	8 7	8 21	5 0	5 15	3 55	4 10	7 11	7 24	0 38	0 54	8 26	8 39	0 40	0 54	1 29	1 43	6 35	6 49	0 28	0 43	9 26	9 40	5 16	5 30
S	25	4 8	4 23	8 35	8 49	5 30	5 45	4 25	4 40	7 37	7 50	1 9	1 21	8 52	9 5	1 8	1 22	1 57	2 11	7 3	7 17	0 58	1 13	9 54	10 8	5 44	5 58
M	26	4 37	4 50	9 4	9 19	6 0	6 15	4 55	5 11	8 3	8 16	1 39	1 54	9 18	9 31	1 36	1 50	2 25	2 39	7 32	7 47	1 28	1 44	10 23	10 41	6 13	6 29
T	27	5 4	5 20	9 35	9 55	6 31	6 50	5 28	5 47	8 30	8 45	2 11	2 29	9 45	10 0	2 5	2 21	2 54	3 10	8 2	8 19	2 1	2 20	11 2	11 27	6 47	7 7
W	28	5 38	5 57	10 13	10 38	7 12	7 37	6 8	6 31	9 1	9 19	2 47	3 7	10 17	10 37	2 40	3 2	3 29	3 50	8 39	9 2	2 40	3 8	11 57	—	7 28	7 53
T	29	6 20	6 45	11 8	11 45	8 5	8 40	6 59	7 34	9 43	10 15	3 30	3 58	11 4	11 41	3 28	4 0	4 14	4 44	9 30	10 4	3 31	4 4	0 32	1 13	8 24	9 2
F	30	7 16	7 54	—	0 25	9 28	10 10	8 16	9 4	10 53	11 36	4 32	5 12	—	0 25	4 40	5 28	5 21	6 6	10 48	11 38	4 45	5 29	2 1	2 48	9 46	10 36

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 18	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbeltion	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 38	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 8	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 38	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 38	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 58	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
370	England—Penzance Bay—Low Lee Rock	Position of buoy.
371	„ Fowey Harbour	Alteration in light.
372	„ Isle of Wight—Shanklin	Lights on pier.
373	„ River Thames—Sea Reach	New buoy.
374	„ W. Cst.—Towan Bay—Listrey Rock	Position of rock and shoal.
375	„ „ Menai Str.—Carnarvon Fairway	Buoy altered.
376	Scotland—W. Cst.—Buoys and Beacons	Gas-lighted.
377	Ireland—S. Cst.—Dungarvan	Shoal and buoyage.
378	„ „ Old Head of Kinsale	Light improved.
379	Baltic Entrance—Skaw—Hölen	New light and fog-signal.
380	Baltic—G. of Finland—Hangö Road	Buoyage.
381	„ „ Fredrikshamn—Aspö	Rock buoyed.
382	„ G. of Bothnia—Malören	Alteration in light.
383	Norway—West Coast.	Various alterations in lights.
384	White Sea—G. of Onega—W. Entrance	Shoal buoyed.
385	„ Solovetski Is.	Position of reefs.
386	„ Arkhangel Bay—N. Dvina Riv.	Dredging operations.
387	France—Seine River—Honfleur	Fog-signal altered.
388	„ Cotentin Chan.—Le Senequet	Shoal not found.
389	„ Brest—Le Coq	Pinnacle rock found.
390	Mediterranean—Italy — G. of Genoa — Port Maurizio	Harbour works in progress.
391	„ Adriatic—G. of Quarnero—Lussin Piccolo	Alteration in time signal.
392	„ Cattaro — Kombur Chan.	Beacon and change in lights.
393	Archipelago—Milo—Bombarda Pt.	New light.
394	Black Sea—Kherson Bay and Bug River	Beacons and buoyage.
395	„ Krimea—Theodosia	Light for mole in progress.
396	Africa—Zanzibar Is.—Ras Kizimkazi	No light intended.
397	China Sea—G. of Siam—Koh Sichang—Hinsammah yeu	Only occasional light.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
398	CHINA SEA—Cochin China—Britto and Holland Banks	Automatic buoys.
399	,, Balabac Str.—Balabac Is.—C. Meville	New light.
400	,, Makassar Str.—Pulo Laut	Coral banks.
401	JAPAN—Kiusiu—Kaki no ura	No sunken rock.
402	RUSSIAN TARTARY—Vostok Bay—Cape Peschurova	Harbour light discontinued.
403	AUSTRALIA AND NEW GUINEA.—Torres Str.	Sand cay and shoal.
404	AUSTRALIA—N. Cst.—Port Darwin	Lighthouse not in progress.
405	,, E. Cst.—Inner Route—C. Weymouth —Tannadice Rock	Amended particulars.
406	,, ,, ,, Elf (L) Reef	Beacon (black) discontinued.
407	,, ,, Double Is. Point	Shoal found.
408	,, S. Cst.—Lady Bay—Warnambool	Breakwater light altered.
409	,, ,, Bass Str.—Eagle Nest Pt.	Alteration in arc of light.
410	SOUTH PACIFIC—Uea (Wallis) Is.—Mata Utui	Sunken rock.
411	NORTH AMERICA—Vancouver Is.—Inner Chan.	Buoyage.
412	SOUTH AMERICA—Chile—Valparaiso—Baja Rock	Automatic buoy.
413	,, Rio de la Plata—Monte Video—Cibil Dock	Dangers in approach.
414	,, Brazil—Santa Catharina—Pedra de Gale	Sunken rock.
415	,, ,, Bahia Bay—Frade Is.	New light.
416	,, ,, Maranham (San Luiz)	System of buoyage.
417	GULF OF MEXICO—Yucatan—Progresso	New lighthouse building.
418	UNITED STATES—Chesapeake Bay—Smith Is. Shoal	Amended position of light-vessel.
419	,, Massachusetts Bay—Salt Rock	Ledge of 4 ft.
420	,, West Penobscot Bay—Portland	Breakwater light altered.
421	CANADA—C. Breton Is.—Louisburg	Automatic buoy re-placed.
422	,, River St. Lawrence	Gas and bell buoys replacing light vessels.
423	LABRADOR—St. Charles Chan., &c.	Various shoals.

NAUTICAL NOTICES.

All bearings Magnetic unless otherwise stated.

370.—ENGLAND.—*South Coast.—Penzance Bay.—Amended Position of Low Lee Rock Buoy.*—This buoy, western side of Penzance bay, is moored in a depth of 11 fathoms, E ¼ S., one cable from the rock. Approx. position, lat. 50° 5′ 30″ N., long. 5° 31′ 10″ W. *Variation*, 19° *W.*

371.—ENGLAND.—*South Coast.—Fowey Harbour.—Alteration in Light.*—The light shown from near White House point, Fowey harbour, has been discontinued, and a new light is exhibited from an iron column (20 ft. high) erected about 40 yards eastward of the previously existing

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light. Fowey harbour new light is an *occ. white* light, visible *twenty seconds*, and eclipsed *five seconds*, elevated 35 ft. above H.W. Approx. position, lat. 50° 20′ N., long. 4° 38′ 15″ W.

Note.—With this light open of St. Catherine point, vessels will pass eastward of Cannis rock.

372.—ENGLAND.—*South Coast.—Isle of Wight.—Shanklin Lights on Pier.*—Two *F. red* lights, placed vertically, are exhibited from the seaward end of Shanklin pier, east coast of Isle of Wight. Approx. position, lat. 50° 37′ 40″ N., long. 1° 10′ W.

373.—ENGLAND.—*River Thames.—Sea Reach.—Buoyage.*—Early in September, 1892, the Leigh spit buoy will be *discontinued;* in lieu thereof a conical buoy, painted black, and named "*Leigh Swatch,*" has been placed to mark the entrance of the new channel leading to Leigh, which has opened out through the Marsh End sand. The buoy lies in 3 ft. L.W. springs, with the following marks :—(1) A conspicuous tall poplar tree in line with the cupola of the pavilion near the inner end of Southend pier, E. by N.; (2) the east side of a yellow brick house (standing east of Leigh pottery chimneys, and just west of a roadway) nearly over the west end of a small white house with flagstaff on the beach.

374.—ENGLAND.—*West Coast.—Towan or New Quay Bay.—Listrey Rock.*—On certain copies of Admiralty plan, Towan or New Quay bay, No. 1,168, Listrey rock has been accidentally omitted. Listrey rock, with a depth of 3 ft. on it, lies with New Quay coastguard flagstaff bearing W. by S. ⅛ S. distant 2¼ cables, and Tolcarne point S.S.E. ¾ E. Approx. position, lat. 50° 25′ 15″ N., long. 5° 5′ 5″ W. *Variation*, 19° *W.* A rock, with less than 6 ft. water on it, lies S.W. half a cable from Listrey rock.

375.—ENGLAND.—*West Coast.—Menai Strait.—Southern Approach.—Alteration in Position of Carnarvon Fairway Buoy.*—This buoy has been moved half a mile to the southward of its former position, and is now moored with Llanddwyn island lighthouse about N.E. ¾ N. 2¾ miles, and Belan point E. ¼ N. Approx. position, lat. 53° 5′ 30″ N., long. 4° 26″ W. *Variation*, 19° *W.*

376.—SCOTLAND.—*West Coast.—Gas Lighted Buoys and Beacons.*—In the course of the next few months, it is intended to substitute gas lighted buoys for two of the existing buoys on the west coast of Scotland, viz.: (1) Middle bank buoy, Sound of Kerrera; and (2) Black rocks buoy, Sound of Islay. They will be *Occ. white* lights. These buoys will be of the same shape and colour as at present in use, but they will have, in addition, the ordinary gas-buoy top mark. Beacons have also been erected at the following places, which will be lighted with gas about the same time as the buoys :—(1) Dubh Sgeir, Sound of Kerrera, *F. white* light; (2) Risantru, Sound of Jura, *F. white* light; and (3) Croulin, Applecross, *Occ. white* light.

377.—IRELAND.—*South Coast.—Dungarvan Harbour.—Shoal at Entrance and Alterations in Buoyage.*—A shoal, with a depth of 5 to

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6 ft. on it and about a cable in extent, lies on the northern side of Dungarvan bay, with Ballinacourty lighthouse bearing E. by N. ¾ N. distant 2½ cables from its centre. Approx. position, lat. 52° 4′ 15″ N., long. 7° 33′ 45″ W. *Variation*, 21° *W.* The channel to Dungarvan, entering from seaward, is marked on the starboard-side by *conical* buoys painted black; and on the port-side by *can* buoys painted red. The warping buoys on both sides of the harbour are painted black.

Note.—The buoys are sometimes taken up for repairs, and then their positions are marked by barrels, not necessarily of the same colour as the buoys they replace.

378.—IRELAND.—*South Coast.—Old Head of Kinsale.—Alteration in Light.*—On and after the 1st September, 1892, the *F.* light on the Old Head of Kinsale will be increased in intensity by changing it from a four-wick to a ten-wick burner; the limits of light, and *red* sector, from Seven Heads to Horse rock, Courtmacsherry bay, will remain as before.

379.—BALTIC ENTRANCE.—*The Skaw or Skagen.—Höien.—Light and Fog-Signal.*—This is a *group Fl. white* light, showing *four flashes every thirty seconds;* each flash being of *two seconds'* duration, the eclipses between the flashes of *three seconds*, and between the groups of flashes of *thirteen seconds'* duration, respectively. Visible from N. 71° E., through south, to S. 89° W., elevated 46 ft. above the sea, and seen 12 miles. Ill. app. dioptric of 3rd order. Lighthouse, 45 ft. in height, is a white octagonal tower, with a white building at its base. Eastward of the lighthouse is a red chimney, 55 ft. high; and south-westward of it a brown screen, about 40 ft. high. Approx. position, lat. 57° 44′ 35″ N., long. 10° 33′ 40″ E. *Variation*, 12° *W.* Also, a fog-signal has been established near Höien lighthouse. It consists of two sirens; one provided with a parabolic reflector painted white, and situated on a sandhill northward of the lighthouse; the other on a sandhill W. by S. ½ S. about nine-tenths of a mile from the lighthouse; which will be sounded alternately so as to give *four blasts every minute.* The western siren sounds loudest in a westerly direction, the eastern one sounds over the whole fairway.

380.—BALTIC.—*Gulf of Finland.—Hangö Road Approach.—Buoyage of Makarova and Savina Shoals.*—Makarova is marked by a *spar* buoy, painted red and white in horizontal stripes, with a black ball surmounted by a cross, moored on the shoal in a depth of 6 fathoms. Approx. position, lat. 59° 44′ 5″ N., long. 23° 2′ 10″ E. Savina, on which a depth of 27 ft. has been found, is marked by a *spar* buoy, painted red and white in horizontal stripes, with a black ball surmounted by a cross, moored on the shoal in a depth of 6 fathoms. Approx. position, lat. 59° 45′ 50″ N., long. 23° 3′ E.

381.—BALTIC.—*Gulf of Finland.—Fredrikshamn Approach.—Rock Southward of Aspö Buoyed.*—This rock (*Tuomola*) of small extent, with a depth of 26 ft. on it, is situated southward of Aspö group, in a position

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with Veit Kari lighthouse N. by E. ¾ E. $2\frac{6}{10}$ miles. Approx. position, lat. 60° 13′ 30″ N., long. 27° 14′ E. *Variation*, 2° *W.* A *spar* buoy, painted red and white in horizontal stripes, surmounted by a cross, has been moored near the rock.

382.—Baltic.—*Gulf of Bothnia.—Malören.—Alteration in Position and Visibility of Light.*—Exhibited from an octagonal wooden tower, 30 ft. in height, placed on the south gable of the light-keeper's dwelling, which is painted red. Malören light (*F. white*) is obscured between the bearings of N. 52° W. and N. 56° W. by the chapel, and between N. 74° W. and N. 79° W. by the old lighthouse. Elevated 42 ft. above the sea, and visible 12 miles. Ill. app. dioptric of 4th order. Approx. position, lat. 65° 31′ 30″ N., long. 23° 33′ 45″ E. *Variation*, 3° *W.*

Note.—Until further notice is given the old lighthouse will be left standing as a day mark.

383.—Norway.—*West Coast.—Alterations in Ulvesund, Skongsnæs, Alnæs and Præsto Lights, and Temporary Discontinuance of Moldö Light.*—(1.) Ulvesund light is a *F.* light, showing *white* from S. 74° E. (over the northern part of the anchorage in Skare bay) to S. 12° E. (from S. 12° east to south the light is observed); *white* from south (eastward of the foul ground on the N.E. coast of Vaagsö) to S. 3° W.; and *red* from S. 3° W. (westward of the shoals south-westward of Sliden) to S. 66° W. (southward of Smörskjær). Approx. position, lat. 61° 59′ 5″ N., long. 5° 10′ 30″ E. *Variation*, 16° *W.*

(2.) Skongsnœs light is a *F.* and *Fl.* light, showing *F. white* from S. 61° E. (northward of Brejflu) to S. 57° E., *flashing* from S. 57° E. to S. 34° E. (over Melsfluer and Ysteflu); *F. white* from S. 34° E. to S. 26° E.; *F. red* from S. 26° E., through south, to S. 4° W. (over Kraaka, Utryggen, and Ystboen); *F. white* from S. 4° W. to S. 7° W., *flashing* from S. 7° W. to S. 14° W. (over Skierboen and rocks westward of Furenœs); and *F. white* from S. 14° W., through west, to N. 26° W. Approx. position, lat. 62° 1′ 55″ N., long. 5° 7′ 45″ E. *Variation*, 16° *W.*

(3.) Alnœs light is a *F.* and *Fl.* light, showing *F. white* from N. 27° E., through east, to S. 47° E., *flashing* from S. 47° E. to S. 34° E. (over Brejflu, Björneboen, Kalsboen and Fauskene); *F. white* from S. 34° E. to S. 31° E; *F. red* from S. 31° E. to S. 14° E. (over Oddeboen, Rauden and Kraaka, the limit S. 31° E. passing over the middle of Lejafald); *F. white* from S. 14° E. to S. 10° E., *flashing* from S. 10° E., through south, to S. 13° W. (over Grimene, Haafleset and Stabben); and *F. white* from S. 13° W., through west, to N. 64° W. Elevated 81 ft. above the sea, and visible in 14 miles. Ill. app. of 5th order. Approx. position, lat. 62° 29′ 20″ N., long. 5° 58′ 25″ E. *Variation*, 16° *W.*

(4.) Prœstö light is a *F.* light, showing *white* from N. 9° E. to N. 14° E.; *red* from N. 14° E. to N. 58° E. (over the rocks to the south-westward), and *white* from N. 58° E., through east and south, to

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S. 64° W. It is elevated 54 ft. above the sea. Approx. position, lat. 64° 47′ 30″ N., long. 11° 7′ 20″ E. *Variation*, 12° *W.*

(5.) Moldö light is temporarily discontinued until certain mining operations in the vicinity are completed.

884.—White Sea.—*Gulf of Onega.—Western Entrance.—Shoal found and Marked by Buoy.*—A shoal, with a depth of 18 ft. on it, is situated westward of Solovetski island, with Sekirnoi (Sekerna) light-house about E. ¼ N. 7 miles. Approx. position, lat. 65° 6′ 50″ N., long. 35° 20′ 35″ E. *Variation*, 5° *E.* A *spar* buoy, painted red and white, surmounted by two red brooms, points away from each other, has been placed on the eastern side of the shoal.

885.—White Sea.—*Western Shore.—Particulars of certain Reefs Westward of Solovetski Island.*—(1.) Kem reef extends about 3½ miles in a N. by E. and S. by W. direction, with a breath of 2 miles, the general depths on it are 8 to 5 fathoms over rocky bottom, but near its northern end, there is a patch with only 3 feet water on it. The north edge of the reef is marked by a perch, situated in approximately lat. 65° 10½′ N., long. 35° 19′ E. (2.) Toparuchni reef lies about 5 cables northward of the position hitherto assigned it, a perch (not perches) marks its north end in approximately lat. 65° 1′ N., long. 35° 11½′ E. (3.) A perch, situated in approximately lat. 65° 1½′ N., long. 35° 6½ E., marks the N.W. edge of the reef with one fathom water on it.

Note.—Sanova (Senova) bay, on the north coast of Solovetski island, should be shown as *Sosnovaya bay.* Depths given are L.W. springs. *Variations*, 5° *E.*

886.—White Sea.—*Arkhangel Bay.—North Dvina River Entrance.—Dredging Operations on Berëzov Bar.*—Dredging operations are being carried on for deepening the western side of Berëzov bar, North Dvina river entrance, and vessels entering must pass eastward of the dredger :—The area being dredged is marked by 6 *spar* buoys carrying black flags, two near the western anchors of the dredger, two near the eastern anchors, one near the anchor ahead and one near the anchor astern of the dredger. Red buoys are also moored over the dredger's anchors, and other spar buoys with black flags will be placed as necessary to mark the operations. Vessels are prohibited from navigating or anchoring within the area marked by these buoys. Steam-vessels approaching the bar must sound a prolonged whistle, when a flag will be hoisted by the dredger to show that the channel is clear ; speed must also be reduced when passing the dredger.

887.—France.—*North Coast.—Seine River.—Honfleur Fog-Signal.—Alteration in Character.*—The fog-horn on the Western pier (not the Eastern pier, as heretofore stated) at Honfleur, has been replaced by a bell, struck by machinery. Approx. position, lat. 49° 25′ 35″ N., long. 0° 14′ 10″ E.

Note.—There is no fog-bell on the Hospital or N.W. jetty at Honfleur.

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388.—FRANCE.—*North Coast.—Cotentin Channel.—Non-existence of Shoal Spot Northward of Le Senéquet Light.*—The shoal spot (1¼ fathom) charted as lying about 2 miles in a N. by W. ½ W. direction from Le Senéquet light, east side of Cotentin channel, does not exist, and there is a depth of 5 fathoms in the position heretofore assigned it. Approx. position, lat. 49° 7′ 10″ N., long. 1° 41′ 20″ W. *Variation*, 17° *W.*

389.—FRANCE.—*West Coast.—Brest Approach.—Sunken Rock N.E. of Le Coq Rock.*—A pinnacle rock, with 10 ft. on it at L.W. springs, and 16 to 20 ft. close around, lies in the approach to Brest from the westward, with Le Coq rock bearing S.W., distant 3½ cables. Approx. position, lat. 48° 19′ 25″ N., long. 4° 48′ 50″ W. *Variation*, 18° *W.*

390.—MEDITERRANEAN.—*Italy.—Gulf of Genoa.—Port Maurizio.—Harbour Works in Progress.*—The extension seaward of the south mole at port Maurizio, for the distance of 75 yards, is in progress. The outer end of the submerged base of these works will be marked by two small buoys; and two *can* buoys, painted red, will be placed N.E. and S.W. respectively from the existing mole head, as mooring buoys for the lighters transporting material. Within the port, on the N.W. side, a quay is in course of construction.

391.—MEDITERRANEAN.—*Adriatic.—Gulf of Quarnero.—Alteration in Time Signal at Lussin Piccolo.*—The time signal is made at mean noon of the meridian of long. 15° E., corresponding to 23h. 0m. 0s. Greenwich mean time. Approx. position, lat. 44° 31′ 50″ N., long. 14° 28′ 5″ E.

392. — MEDITERRANEAN. — *Adriatic. — Eastern Shore. — Cattaro Approach.—Beacon Erected in Kombur Channel, Intended Withdrawal of Floating Beacon, and Intended Light.*—Kombur channel beacon, constructed of masonry, is a truncated pyramid in shape, with a stairway on the western side, and 10 ft. in height above the water. It stands in a depth of 7 ft. water, with Bianca point bearing about W. by N. ½ N., distant 3 cables. Approx. position, lat. 42° 26′ N., long. 18° 36′ 30″ E. *Variation*, 8° *W.* Also, the floating beacon, moored half a cable southwestward of the above position would be withdrawn, and it is intended to exhibit a light from the beacon recently erected.

393.—MEDITERRANEAN.—*Archipelago.—Port Milo.—Harbour Light on Bombarda Point.*—Exhibited from Bombarda point, northern side of port Milo. It is a *F. green* harbour light, elevated 184 ft. above the sea, 20 ft. above the ground, and visible 4 miles, shown from an iron mast, attached to an iron building. Approx. position, lat. 36° 43′ 10″ N., long. 24° 26′ 30″ E.

394.—BLACK SEA.—*Russian Coast.—Kherson Bay and Bug River.—Beacons and Buoyage.*—(1.) The red pyramidal beacon off Sari Kamishi, north shore of Kherson bay, has been replaced by a red buoy, from which is exhibited a *F. red* light, elevated 15 ft. above the sea. Approx. position, lat 46° 37¼′ N., long. 31° 55′ E. (2.) The red pyramidal beacon S.W. of cape Stanislav, east shore of Kherson bay, has been

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replaced by a red buoy, from which is shown a *F. red* light, elevated 15 ft. above the sea. Approx. position, lat. 46° 32′ N., long. 32° 7½′ E. (3.) The red perch with light eastward of fort Konstantine, west side of the channel, Búg river (below Nikolaef), has been replaced by a red pyramidal beacon, with staff and ball, from which is shown a *F. red* light, elevated 10 ft. above the water. (4.) The black perch near the south extreme of Laiskov spit, north side of the channel, Búg river, nearly opposite Didova Khata lighthouse, has been replaced by a black pyramidal beacon, from which is exhibited a *F. red* light, elevated 8 ft. above the water.

Note.—The lights off Sari Kamishi and cape Stanislav (1, 2) are intended to burn day and night, but absolute reliance should not be placed on them, as they may be extinguished accidentally, in which case some time may elapse before they are relighted.

395.—Black Sea.—*Russian Coast.—Krimea.—Theodosia.—Light Marking Mole in Progress.*—A *F. red* light, elevated 23 ft. above the sea, marks the outer end of the mole in course of construction (and now extending about 60 yards seaward) at Theodosia.

Note.—The construction of a harbour at Theodosia, intended to have a depth of 28 ft., has been commenced.

396.—Africa.—*East Coast.—Zanzibar Island. —South Coast.—Ras Kizimkazi. – Completion of Lighthouse Abandoned.*—The lighthouse on Ras Kizimkazi, south extreme of Zanzibar Island, has not been completed, and appears like a ruin. It is not intended to establish a light on this point. Approx. position, lat. 6° 28′ S., long. 39° 29′ E.

397.—China Sea.—*Gulf of Siam.—Koh Sichang Harbour Approach. —Hin Sam Mah Yeu Light not to be relied on.*—With reference to notice in 1891 :—The *F. red* light, named Asadang Prapakar, on Hin sam mah yeu, approach to Koh sichang harbour from the northward, cannot be relied on, as it is only exhibited occasionally. Approx. position, lat. 13° 11¼′ N., long. 100° 46¾′ E. "Occasional" should be placed against this light on charts.

398.—China Sea.—*Cochin China.—Britto and Holland Banks.— Automatic Signal-Buoys Placed.*—These whistle buoys have been placed, one at the N.E. and one at the N.W. extreme of Britto bank ; and one on the west side of Holland bank, coast of Cochin China. N.E. Britto bank buoy is painted black and white in horizontal bands, with the word *Britto* on it ; and is moored in 6½ fathoms, with Kega point N.E. by N. 15½ miles and cape Ba Ké W. ⅛ S. Approx. position, lat. 10° 29′ N., 107° 51½′ E. N.W. Britto bank buoy is painted black and white in vertical stripes, with the word *Britto* on it ; and is moored in 7 fathoms W. by N. ¼ N. one mile from the N.E. buoy.

Note.—A depth of 1¼ fathom has been found at the southern extreme of Britto bank, in approximately lat. 10° 28¼′ N., long. 107° 50¼′ E. To avoid the northern end of Britto bank, vessels should pass upwards of a cable northward of the line joining the two buoys. Holland bank

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buoy is painted white, with the word *Hollandais* on it; and is moored in 7 fathoms, with Pulo Cecir de Mer N.E. summit E. by S. ¼ S. 18¾ miles. Approx. position, lat. 10° 39½′ N., long. 108° 40′ E. *Variation*, 3° *E.*

399.—China Sea.—*Balábac Strait.—Balábac Island.—Light near Cape Melville.*—Lighthouse erected north-westward of cape Melville, the southern point of Balábac island. It shows a *Fl. white* light every *twenty seconds*, visible through an arc of 265°, or from S. 63° W. to S. 32° E.; elevated 297 ft. above the sea, 90 ft. above the ground, and seen 24 miles. Ill. app. catadioptric of 1st order. Lighthouse of masonry, and octagonal in shape, with the keeper's dwelling near, is situated within an enclosure, at a distance of about 750 yards from the coast. Approx. position, lat. 7° 49′ 20″ N., long. 117° 0′ 10″ E. *Variation*, 2° *E.*

400.—China Sea.—*Strait of Makassar.—Coral Banks Eastward of Pulo Laut.* — The Commander of H.N.M. surveying-vessel *Banda* reports two coral banks eastward of pulo Laut, eastern coast of Borneo :— (1.) A bank, with a least depth of 6 fathoms, and 20 fathoms, mud bottom, around, lies with Sembargélap islands about W. ¾ N., 8 miles. Approx. position, lat. 3° 41′ S., long. 116° 44½′ E. (2.) A bank, with a least depth of 7 fathoms, and 30 fathoms, mud bottom, around, lies approximately 36 miles southward of bank No. 1. Approx. position, lat. 4° 18′ S., long. 116° 42½′ E. *Variation*, 3° *E.*

401.—Japan.—*Kiusiu.—West Coast.—Kaki No Ura.—Non-existence of Sunken Rock.*—Commander of H.I.J.M.S. *Akagi* reports having closely sounded over and around the position of the dangerous sunken rock, charted as lying about 7 cables westward of Mutajima, Kaki no Ura, but no indication of the rock was found, the depths in the locality being 16 to 19 fathoms. The natives also stated that no such rock exists. Approx. reported position, lat. 33° 1′ 25″ N., long. 129° 33′ E.

402. — Russian Tartary.— *Vostok Bay. — Cape Peschurova.* — The *F. red* harbour light, shown from cape Peschurova, western side of entrance to Vostok bay, has been *discontinued.* Approx. position, lat. 42° 50′ 45″ N., long. 132° 43′ 30″ E.

403.—Australia and New Guinea.—*Sand Cay and Shoal in Western Approach to Torres Strait.*—(1.) A sand cay (*Turu cay*), 8 ft. above H.W., is situated in approximately lat. 9° 58′ S., long. 141° 27′ E. (2.) A shoal, with 2½ fathoms on it at L.W., lies in approximately lat. 9° 43′ S., long. 140° 56′ E.

404. — Australia. — *North Coast. — Approaches to Port Darwin, Northern Territory.*—Referring to notice in 1891, the erection of the lighthouse on point Emery is postponed for the present.

405.—Australia.—*East Coast.—Inner Route.—Cape Weymouth.—Amended Particulars of Tannadice Rock.*—From recent examination Tannadice rock has been found to have a least depth of 5 ft. on it at L.W. springs, and to lie with Restoration rock (136) bearing N. 58° W., distant 5⅛ miles, or about 7 cables E. by N. ¾ N. from the position

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heretofore assigned it. Approx. position, lat. 12° 40′ 30″ S., long. 143° 30′ 20″ E. *Variation*, 5° *E.*

406.—AUSTRALIA.—*East Coast.—Inner Route.—Elf* (*L*) *Reef.—Disappearance of Black Beacon.*—The black beacon formerly situated at the S.W. extreme of Elf (L) reef, Inner route, has disappeared, and will not be replaced. Approx. position, lat. 13° 50′ 10″ S., long. 143° 49′ 40″ E.

407.—AUSTRALIA.—*East Coast.—Double Island Point.—Shoal Northward.*—A shoal, with a depth of 13 ft. on it, is situated 2½ cables from the northern extremity of Double island point in the direction of Wolf rock. Approx. position, lat 25° 55′ 20″ S., long. 153° 12′ 45″ E.

408.—AUSTRALIA.—*South Coast.—Lady Bay.—Warnambool Breakwater Light.—Alteration in Arc of Visibility.*—With reference to notice, the *F. red* light at the end of the breakwater at Warnambool is obscured seaward, and not visible southward of the line indicated by the direction north-eastward of the breakwater. Approx. position, lat. 38° 24′ 15″ S., long. 142° 28′ 50″ E.

409.—AUSTRALIA.—*South Coast.—Bass Strait.—Eagle Nest Point.—Alteration in Arc of Red Light.*—With reference to notices in 1891, the arc of the *red* or principal light on Eagle Nest (Split) point has been reduced about 3°, and will illuminate an arc of 150°, or from 1¼ mile off Addis point to the N.E., to one mile off cape Patton to the S.W.; while the arc of *white* light shown towards Addis point has been increased about 3°, thereby showing an arc of *white* light from the shore to 1½ mile off Addis point.

Note.—The *white* lights are to warn mariners of too close proximity to the shore, and care should be taken to round Eagle Nest point at not less a distance than 3 miles from the lighthouse. Approx. position, lat. 38° 28′ 15″ S., long. 144° 6′ 30″ E.

410.—SOUTH PACIFIC.—*Uea or Wallis Islands.—Mata Utui Anchorage Approach.—Sunken Rock Eastward of Matalaa Point.*—The captain of the French vessel-of-war *Saône*, reports the existence of a rock, with a depth of 2¼ fathoms on it, situated in Faioa pass, approach to Mata Utui anchorage, with Matalaa point bearing W. ¾ S., distant 9 cables, and Finekovi point S. by W. ¾ W. Approx. position, lat. 13° 20′ 35″ S., long. 176° 7′ 25″ W. *Variation*, 9° *E.*

411.—NORTH AMERICA.—*West Coast.—Vancouver Island.—Buoyage of Inner Channels.*—The undermentioned buoys have been placed in the inner channels between Vancouver islands and strait of Georgia:—

(1.) *Sidney Channel, South Entrance.*—A *spar* buoy, painted black, and showing 10 ft. above the water, on the S.E. extreme of the two 3-fathom patches west of Darcy island. Approx. position, lat. 48° 34′ 15″ N., long. 123° 18′ 25″ W.

(2.) *Mill Creek, Cowitchin Harbour.*—A light *spar* buoy, painted red, on the end of the reef, east side of entrance to the creek. Approx. position, lat. 48° 45′ 45″ N., long. 123° 35′ 50″ W.

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(3.) *Near Shoal Islands, Stuart Channel.*—A *spar* buoy, painted black, on an uncharted rock off Shoal islands. This rock lies half a cable N. 35° W. from, and is a continuation of, the rock awash at H.W. marked on the charts, and just dries at L.W. springs. Approx. position, lat. 48° 53′ 40″ N., long. 123° 38′ W.

(4.) *Grappler Reef, Houston Passage.*—A *spar* buoy, in 7 fathoms water, on the S.W. extreme of the reef. Approx. position, lat. 48° 56′ 35″ N., long. 123° 36′ 25″ W. *Variation*, 23° *E.*

412.—South America.—*Chile.—Valparaiso Bay.—Buoy near Baja Rock.*—An automatic whistle buoy, painted red, has been placed close southward of Baja rock, west side of entrance to Valparaiso bay.

413.—South America.—*East Coast.—Rio de la Plata.—Monte Video Bay.—Dangers in approach to Cibil Dock.*—A recent survey has revealed the following dangers in the approach to Cibil dock, western side of Monte Video bay:—(1.) A rock, with less than 6 ft. over it at L.W., lies with Cibil dock chimney W. ½ N. $2\frac{9}{10}$ cables, and south-eastern White rock S.W. ½ S. Approx. position, lat. 34° 54′ 30″ S., long. 56° 15′ 0″ W. *Variation*, 7° *E.* (2.) A rock, with a depth of 8 ft. on it at L.W., lies S.W. by W. $1\frac{4}{10}$ cable from rock No. 1, with Cibil dock chimney N.W. by W. ½ W. (3.) Between rocks Nos. 1 and 2 the ground is generally foul, with depths of as little as 4 to 6 ft., rocky bottom, in places. (4.) In entering Cibil dock by the best approach, a depth, one foot less than the depth on the sill of the dock at the time, must be passed over.

414.—South America.—*Brazil.—Santa Catharina Northern Approach.—Sunken Rock South-Westward of Pedra de Gale.*—This rock (*Iris rock*), with a depth of 14 ft. on it, is situated in the northern approach to Santa Catharina strait, with Bombas point N. by W. $2\frac{9}{10}$ miles, and north extreme of Pedra de Gale N.E. by E. ½ E. Approx. position, lat. 27° 12′ 15″ S., long. 48° 27′ 50″ W. *Variation, nil.*

415.—South America.—*Brazil.—East Coast.—Bahia Bay.—Light on South Point of Frade Island.*—Exhibited on N^a S^a do Guadalupe, southern point of Frade island, Bahia bay. Nossa Senhora do Guadalupe light is *F. red*, elevated 100 ft. above H.W., 31 ft. above the ground, and visible 9 miles: shown from an iron mast, painted red, with a circular gallery and flight of steps. Ill. app. dioptric of 6th order. Approx. position, lat. 12° 48′ 50″ S., long. 38° 38′ 25″ W.

416.—South America.—*Brazil.—Maranham or San Luiz Harbour.—System of Buoyage.*—The term starboard denotes that side which is on the right hand of the mariner entering from seaward, the term port that on the left hand under the same circumstances:—(1.) *Conical* buoys, painted red, with even consecutive numbers, mark the starboard side of the channel; (2.) *Can* buoys painted black or black and white, with odd consecutive numbers, mark the port side of the channel; (3.) Buoys or other marks, in mid-channel, are painted in horizontal stripes of any two colours; (4.) Buoys marking rocks in the channel, with a passage

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on either side, are painted in black, red, and white horizontal stripes; (5.) Wreck-marking buoys are painted green, with the letters C.S. on them.

417.—GULF OF MEXICO.—*Yucatan.—Progresso.—Intended Alterations in Light.*—A new lighthouse is in course of construction, from which, probably in December, 1892, a light will be exhibited, replacing the present light. Progresso light will be a *Fl. white* light of 2nd order, showing a flash of *nine seconds'* duration *every minute*, and elevated about 112 ft. above H.W. Lighthouse, circular, constructed of stone, stands on a concrete foundation over sand. Approx. position, lat. 21° 17′ N., long. 89° 39′ W.

418.—UNITED STATES. — *Virginia. — Chesapeake Bay. — Amended Position of Smith Island Shoal Light-Vessel.*—This light-vessel lies with cape Charles lighthouse bearing W. by N. ½ N., distant 8½ miles. Approx. position, lat. 37° 5′ 30″ N., long. 75° 42′ 50″ W. *Variation*, 4° *W.*

419.—UNITED STATES.—*Massachusetts.—Massachusetts Bay.—Ledge Eastward of Salt Rock.*—This ledge (*Boo hoo ledge*) lies on the northern shore of Massachusetts bay, with Salt rock bearing W. by N. ½ N., distant about 1½ cable, and Baker island lighthouses S.W. by W. The ledge is small in extent, and has 4 ft. on it at L.W. Approx. position, lat. 42° 33′ 45″ N., long. 70° 45′ W. *Variation*, 18° *W.*

420.—UNITED STATES.—*Maine.—West Penobscot Bay.—Rockland Harbour.—Alteration in Breakwater Light.*—These are now *two F. red* lantern lights, placed vertically, one elevated 23 ft. the other 29 ft. above H.W. Approx. position, lat. 44° 6′ 40″ N., long. 69° 4′ 50″ W.

421.—CANADA.—*Cape Breton Island.—Louisburg Harbour Approach. —Automatic Whistle Buoy Replaced in Position.*—With reference to notice in 1890, the automatic whistle buoy has been replaced in position in the approach to Louisburg harbour, with the lighthouse at that harbour entrance bearing N.W. ½ W., distant 1⅝ mile. The buoy, painted red, is moored in 30 fathoms water. Approx. position, lat. 45° 54′ N., long. 59° 55′ 10″ W. *Variation*, 26° *W.*

Note.—From the buoy, a N.W. by W. course will lead northward of Harbour shoal, and to the entrance of the harbour.

422.—CANADA.—*River St. Lawrence.—Tremble Shoals and Paget Bank.—Gas and Bell Buoys Replacing Light-Vessels.*—Two combined *gas* and *bell* buoys are moored in river St. Lawrence above Quebec, replacing the light-vessels moored off the S.E. extreme of Tremble shoals, and west end of Paget bank (near Ste. Croix), in approximately lat. 46° 41¼′ N., long. 71° 33¼′ W., and lat. 46° 38¼′ N., long. 71° 44′ W. respectively. Each buoy shows an *Occ. white* light, elevated 14 ft. above the water, and is fitted with an automatic bell; they are painted red, with the words *Trembles shoal* and *Ste. Croix* on them respectively.

423.—NORTH AMERICA.—*Labrador.—Shoals in St. Charles Channel, and near Sandwich Bay.*—Information from H.M.S. *Emerald*:—(1.)

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St. Charles Channel.—The small bay southward of Assizes island, and between it and Hare island, has less depths than heretofore charted, there being two and three fathoms water where six to ten fathoms are shown. It is also stated by local fishermen that the space between Dumpling island and the mainland has likewise shoaled. Approx. position, lat. 52° 15′ N., long. 55° 41′ W.

(2.) *Sandwich Bay.*—The channel between Pompey and Red islets should not be used till further examined, the charts show 21 fathoms in mid-channel, but the *Emerald* obtained depths of 6 to 11 fathoms when passing through. Approx. position, lat. 53° 47½′ N., long. 56° 45½′ W. Sandwich Tickle, the main entrance to Sandwich bay, is locally reported to have shoaled to such an extent, that it is practically closed to navigation. Approx. position, lat. 53° 44½′ N., long. 57° 5′ W.

Note.—In the northern approach to Sandwich bay, the *Emerald* obtained soundings of 9 and 11 fathoms, with North Stag island summit bearing N. 50° W., distant about two miles. Position to be considered doubtful, lat. 54° 5′ N., long. 57° 8½′ W. *Variation*, 40° *W.*

OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
6th August, 1892.

The following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

Note.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
1825B	Irish Channel, Sheet II.	Revised and corrected generally. July.
1634	England, S.: Start Bay	New Chart. July.
1351	Scotland, W.: Plans of anchorages in the Hebrides, Benbecula, Loch Uskavagh; S. Uist, Loch Eynort	New Chart. July.
1413	Wales: Holyhead Bay	Small correction. July.
249	Tunis: Mehedia to Ras Makhabez	New Chart. August.
253A	Africa, E.: Jebel Jan to Seyára ..	Gulf of Tajura, and new plan of Jibuti Bay. June.
1002	Madagascar, N.: Diego Suarez Bay to Andranoaombi Bay ..	New Chart. July.
1650	Borneo, N.: Mallawallé Island to Lankayan	New Chart. July.

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Chart No.	Title of Chart.	Nature and Subject of Correction.
1649	Borneo, N.: Lankayan to Sandakan Harbour	New Chart. August.
1047	Australia, N.W.: Cape Ford to Buccaneer Archipelago	Cape Londonderry to York Sound. July.
1300	S. America, W.: Plans on the coast of Chile	New Chart. July.
299	Newfoundland, W.: Old Férolle Harbour and Brig Bay	New Chart. July.

Agent for the sale of Admiralty Charts, Mr. J. D. Potter, 31, *Poultry, London, E.C.*

Official Return of British Wrecks in July, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of July, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	41	 11,110	 98
Steam	7	 9,610	.... Nil.
Total	48	 20,720	 98

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports received in July relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—George J. Swanston, Assistant-Secretary, Marine Department, Board of Trade, 2nd August, 1892.

The Board of Trade have received through the Foreign Office binocular glasses, which have been awarded by the French Government to Mr. Frederic Hassold, master, and Mr. Christopher Blackwell, second mate, of the s.s. *Guienne*, of Liverpool, in recognition of the services they rendered to the shipwrecked crew of the French schooner *Renée Séraphine* on the 30th October last. The Board have also received silver medals and diplomas for the five seamen of the *Guienne* who manned the rescuing boat, viz., George Mowat, Peter Carthinnsen, Louis Minter, Frederick Martin, and David Mulholland.

The Board of Trade have received through the Foreign Office a silver medal and diploma, presented by the Italian Government to Mr. Charles Law, master of the s.s. *Fusi Yama*, of London, in recognition of his services in rescuing the shipwrecked crew of the Italian barque *Prudenza*, of Genoa, on the 31st October last.

The Board of Trade have received a communication from the Secretary of State for Foreign Affairs stating that a Treaty has been signed between

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Great Britain and the United States for the mutual surrender of deserters from the merchant vessels of either country while in the ports of the other. The Treaty, though signed, will require the sanction of the Senate before it can come into operation.

The Board of Trade have received through the Foreign Office a gold watch, which has been awarded by His Majesty the Emperor of Germany to Mr. W. Henry Morgan, master of the fishing steamer *North Sea*, of Hull, in recognition of the assistance rendered to the crew of the German schooner *Thetis* when in danger at sea in the middle of October last. The Board have also received a sum of £5 each for the seamen, E. Connah and Joseph Etherington, of the same vessel.

The President of the Board of Trade has appointed Mr. Francis J. S. Hopwood of that Department to be his Principal Private Secretary.

Official Inquiries at Home, 1892.

4547. *Comet*, s.s.; built at Cardiff, 1876; owned by Mr. R. M. Hudson and others; tonnage, 24; Saltburn to Newcastle; 175 passengers; stranded near Seaham, June 22, 1892. Inquiry held at Sunderland, July 13, 1892, before Booth and Wilson, Justices; Methven and Parfitt, N.A. Stranding owing to the course set not being made good, which was probably caused by the passengers' landing gangway with its iron fittings having been placed within a foot of the compass.

4548. *Bowesfield*, s.s.; built at Stockton, 1880; owned by Mr. E. Aston and others; tonnage, 961; Swansea to Ancona; coal; stranded 1¼ mile S.E. of Faro Light, Straits of Messina, May 21, 1892. Inquiry held at Middlesbrough, July 13, 1892, before Coleman, Judge; Anderson and Baker, N.A. Stranding owing to vessel not having been kept in mid-channel, which the master had ample opportunity of doing by the bearing of Pezzo Light. Certificate suspended for four months.

4549. *Nautilus*, fishing ketch; built at Newhaven, 1877; owned by Mr. W. Cox; tonnage, 69; Dogger Bank to Hull; stranded near Aldborough, Yorkshire, April 8, 1892. Inquiry held at Hull, July 13, 1892, before Twiss, Judge; Parish and Richardson, N.A. Stranding owing to vessel having been kept running towards the land in a thick fog without recourse to the lead.

4550. *Peninsula*, s.s.; built at Sunderland, 1879; owned by Mr. A. Scholefield and others; tonnage, 1,037; Tyne to Cronstadt; coal; stranded on South Reef, Oland, May 14, 1892. Inquiry held at Newcastle, July 14, 1892, before Nelson and Culley, Justices; Ward and Wilson, N.A. Stranding caused by the inefficient look-out kept, the beacon on the extreme end of reef having escaped attention; but as master was misled by his charts and directions as to the number of beacons his certificate was not dealt with.

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4555. *Dacia*, s.s.; built at Willington Quay, 1892; owned by International Line Steamship Company, Limited; tonnage, 1,904; Barry to Port Said; coal; stranded near Point Sagres, Portugal, June 27, 1892. Inquiry held at Whitby, July 20, 1892, before Gray and Corner, Justices; Anderson and Bragg, N.A. Stranding caused by the non use of the lead, and by navigating at too great a rate of speed and steering too fine a course in thick weather. Certificate of master suspended for six months.

4556. *Main*, s.s.; built at Greenock, 1868; owned by Anglo-American Steamship Company, Limited; tonnage, 1,808; New Orleans to Liverpool; cotton and general; beached on fire at Fayal, March 23, 1892. Inquiry held at Liverpool, July 18, 1892, before Stewart, Judge; Bain, Bragg and Phillips, N.A. Court unable to discover origin of fire.

4557. *City of Chicago*, s.s.; built at Glasgow, 1883; owned by Inman and International Steamship Company, Limited; tonnage, 3,864; New York to Liverpool; general and 360 passengers; stranded on Old Head of Kinsale, July 1, 1892. Inquiry held at Liverpool, July 21, 1892, before Stewart, Judge; Wilson and Richardson, N.A. Stranding owing to master, when uncertain of his position, altering course towards land and continuing at full speed in thick weather without using the lead with sufficient frequency. Certificate suspended for nine months. Fog-signal recommended on Old Head of Kinsale.

4561. *Chadwick*, s.s.; built at Wallsend, 1882; owned by Chadwick Steamship Company, Limited; tonnage, 917; Glasgow to Cronstadt; coal; stranded near An Ceannaich, Loch Pooltiel, West Skye, July 2, 1892. Inquiry held at North Shields, July 28, 1892, before Burnett and Haswell, Justices; Cosens and Brooks, N.A. Stranding owing to the course set not being made good, and to master entering a narrow channel during foggy weather when he had no positive knowledge of the error of his compass or of distance run. Certificate suspended for three months.

4562. *Curlew*, s.s.; built at Campbeltown, 1886; owned by Mr. A. F. Blackater; tonnage, 122; St. Servan, Britanny, to Cowes; ballast; stranded on Roches Douvres, S.W. of Jersey, June 28, 1892. Inquiry held at Glasgow, July 22, 1892, before Guthrie, Judge; Castle and Bain, N.A. Stranding due to master neglecting to make allowance for strong ebb tide. Certificate suspended for six months; recommended for one as mate.

4485A. *Cremona*, s.s. (re-hearing); built at Greenock, 1883; owned by Mr. J. Currie and others; tonnage, 740; Leith to Methil; stranded near Buckhaven, Firth of Forth, February 20, 1892. Inquiry held in the first instance at Edinburgh, March 16, 1892, when Court found stranding was caused by vessel becoming unmanageable from want of ballast, and ordered owner to pay £20 towards costs for allowing vessel to go to sea with ballast tank empty. Re-heard at Edinburgh, July 26, 1892, before Lord Wellwood; Vyvyan and Slader, N.A. Owner not in

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fault in allowing vessel to proceed to sea, the weather being comparatively fine and the voyage but 13 miles. Court also not satisfied that vessel was unmanageable. Previous decision recalled and owner allowed expenses.

Fishery Inquiry, 1892.

S. 63. *Rover* and *Lyra*, ketches; former built at Grimsby, 1878; owned by Mr. G. J. Tidman; tonnage, 77; latter built at Galmpton, Devonshire, 1883; owned by Mr. H. Fraser; tonnage, 81; in collision in North Sea, May 5, 1892, when former sank and one life was lost. Inquiry held at Hull, July 28, 1892, before Twiss, Judge; Hoare, Cuninghame and Toozes, N.A. Collision owing to *Rover*, which was on port tack, not complying with Art. 14B of the Regulations. The *Lyra* also infringed Art. 24, as she was left entirely in charge of deck-hand. Certificates of both skippers suspended for three months.

Official Inquiries Abroad, 1892.

4546. *Dolores*, s.s.; stranded on Polonia Rock, May 22, 1892. Inquiry held at Monte Video, June 8, 1892. Stranding owing to sufficient measures not having been taken to verify the distance from Polonia Lighthouse; to the neglect to take bearings; and to the unsafe course steered. Certificate of master suspended for three months, and ordered to pay costs, £7 19s.

4551. *Lumen*, s.s.; stranded on St. Elmo Point, Malta, July 1, 1892. Inquiry held at Malta, July 5, 1892. Casualty owing to master starboarding to a fishing boat ahead when he was aware that land existed on his port bow. Certificate suspended for one month.

4552. *Chamois*, s.s.; struck bank of Suez Canal, June 11, 1892. Inquiry held at Malta, June 18, 1892. Casualty owing to strong current causing vessel to sheer.

4553. *Lavernock*, s.s.; stranded between Wood Cay and Sandy Cay, Grand Bahama, May 22, 1892. Inquiry held at New Providence, June 8, 1892. Stranding attributed to an unknown current or a temporary error in compass.

4554. *John M. Blaikie*, ship; stranded on Fourth Point, Java, May 4, 1892. Inquiry held at Singapore, May 24, 1892. Stranding owing to master miscalculating his distance from shore when about to anchor, and to a sudden change in the wind.

4558. *Oceana*, ship; stranded off Punta Brava Point, near Monte Video, June 7, 1892. Inquiry held at Monte Video, June 17, 1892. Stranding owing to master not constantly taking bearings, and to his not altering course sufficiently on sighting Cerro Light. Certificate suspended for three months, and ordered to pay costs, £11 16s.

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4559. *Queen*, schooner; missing on voyage from Sydney to Port Macquarie. Inquiry held at Sydney, May 23, 1892. Vessel seaworthy on sailing, but she encountered exceptionally heavy weather about February 26, 1892.

4560. *Tekapo*, s.s.; grounded at Stony Point, January 29, 1892. Inquiry held at Newcastle, N.S.W., June 3, 1892. Grounding caused by vessel having to give way to another vessel at the narrowest part of channel.

4563. *Chilian*, barque; stranded on San Blas Bank, Patagones, May 8, 1892, when two lives were lost. Inquiry held at Buenos Ayres, June 24, 1892. Stranding owing to master not using the patent log, and, when close in land, not taking frequent soundings. Certificate cancelled until the Board of Trade are satisfied that he is again fit to be in possession of it.

4564. *Camelot*, s.s., and *Diamond*, s.s.; in collision in the New Harbour, June 1, 1892. Inquiry held at Singapore, June 13, 1892. *Camelot* to blame for collision, as she infringed Art. 22 of the Regulations.

4565. *Orange Nassau*, Dutch s.s., and *Pirata*, sloop; in collision near Grand Boca, March 18, 1892. Inquiry held at Trinidad, June 29, 1892. Sloop to blame for not keeping her course.

4566. *Limpopo*, s.s.; stranded on Cousin Rock, Réunion. Inquiry held at Mauritius, July 4, 1892. Master not justified in giving up command to an authorised pilot. Certificate suspended for six months.

NOTES.

HULL, Leith, and Shields, are probably the only places in our islands where navigation is scientifically taught. Mr. Zebedee Scaping, Headmaster of the Trinity House Navigation School at Hull, is to be congratulated on the result of the May Science and Art Department Excellent Examination in Navigation. Ninety-two of his students under 15 years of age went up for this test and not one failed. In the advanced stage 13 obtained first-class and 20 second-class certificates, while in the elementary stage there were 57 first class and 2 second class. In June, 1870, Mr. Scaping was warmly commended by the late Dr. Woolley, then examiner in Navigation, who referred to him in giving evidence before the Royal Commission of Scientific Instruction as "one of the very best masters of a navigation school in England." We cordially endorse this view. Hull Trinity House Navigation School deserves to be

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more widely known. Boys over 11 years of age are admitted after passing an elementary examination, provided they are desirous of a sea life and physically fit. They are granted a free general and nautical education, clothing twice a year, a sum of £5 or £2 10s. for a sea outfit on apprenticeship for not less than three years, and at the close thereof £1 for each year faithfully served. The ten boys who pass the best entrance examinations yearly are also paid £5 each at the expiration of the first year's service. Better theoretical training than that afforded by Mr. Scaping and his skilled assistants it would be difficult to find; but a four years' apprenticeship under an uncaring shipmaster is sufficiently long for a boy to forget all that he has learnt. Some method must be devised whereby the benefits of the Science and Art Department system may be extended to apprentices at sea. This is the crux of the nautical education question.

THE Liverpool Nautical College is now under weigh, and will, we hope, have a long career of usefulness before it. The staff consists of Mr. J. Gill (the headmaster), assisted by Captain Owens, Technical Instructor, and Mr. Lockington, Mathematical Instructor. Captain Owens for many years commanded one of the Warren Line of steamers, and more recently one of the Hall Line of Bombay steamers. Mr. Lockington holds the Diploma of the London University and was formerly on the staff of the Liverpool College. It will be observed that the course of study will not be of a very extensive nature, comprising only navigation, seamanship, and mathematics. It is a very significant feature in the Minute of the City Council confirming these appointments to the Nautical College, that they are terminable at three months' notice in the event of the Council deciding not to continue the College. It now remains to be seen whether the College will achieve results that will warrant the Liverpool Corporation in making it a permanent institution.

THE improvements which have been effected in sailing-ships during the past ten years have resulted in not only great economy in working, but also in comfort to the crews. This is very strikingly exemplified by the large cargoes carried, and the comparatively small crews. One of the most completely equipped sailing-ships is the *James Kerr*, of Liverpool, which has just sailed for Calcutta. This vessel is built of steel, and

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is about 3,600 tons dead weight. She is rigged as a four-masted barque. All the spars are of steel, and there are double topgallant and topsail-yards. The yards on all three masts are of the same relative size, so that a spare topgallant-sail can be bent on either the fore, main, or mizzen topgallant-yards. Another feature is the employment of small capstans of a very ingenious make, whereby the heavy topsail-yards, weighing some four tons a-piece, can be hoisted by five men in about ten or eleven minutes. Formerly, setting the topsails required all hands at the halliards. Now it only takes one-third of the watch on deck. These capstans are not worked by handspikes, but are turned by winch handles; they have a fast and slow speed corresponding to a greater or less power exerted. They are manufactured by the American Ship Windlass Company, and are beyond question most useful machines for sailing-ships. The *James Kerr* has a midship bridge deck-house, which contains a magnificent saloon, with bath-room, office, sleeping and dining-rooms for the captain. A piano and harmonium are also provided. Adjoining the saloon are the officers' rooms, each officer having his own room, all of which are fitted up in the best mail-steamer fashion. In the forepart of the saloon is the accommodation for the petty officers and apprentices, and this is of a very superior character. This system of housing the officers, petty officers, and apprentices with the captain is a most excellent one, as it is conducive to the maintenance of authority over an unruly crew. Forward, in a deck-house, are the quarters of the sailors; there are proper lockers and shelves for each man, and outside, in a passage, a place for hanging wet clothes. A bath-house and wash-house are built for their use. The *James Kerr* is an exceptionally well-found and well-designed vessel, and it is pleasing to see these efforts to render the lives of those on board comfortable and pleasant. Her commander, Captain Powles, is an old *Conway* boy, with a most excellent reputation; while the managing owner, Captain Peel, was for many years the Marine Superintendent of the Star Line of Calcutta steamers. Captain Peel believes in giving a man good quarters and good food and good pay, and he expects good work in return; and, as he says, he usually gets it. His experience is that the British sailor is by no means played out; he, however, wants good treatment. In these days of preference for foreigners and low wages, it is well to know that there are yet many British owners who,

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like Captain Peel, worthily maintain the best traditions of the Merchant Service.

We are glad to record that Mr. Ingram Walker, of the Board of Trade, son of the late Captain Sir W. H. Walker, for many years marine adviser to the Board, has been appointed Assistant Secretary of the Finance Department in place of Mr. Allen Stoneham, retired.

The capsize and foundering of the new steel-ship *Thracia*, with the loss of all hands, is a case which calls for very searching investigation. This vessel is one of a very familiar type, and there are no departures in her design or construction which can account for the accident. She is a steel four-masted barque, 282 ft. by 42 ft. by 24 ft. She has, like all the vessels of her class, a full midship section, very flat floor, and moderately fine ends. These vessels have great initial stability, and many of them can ship without ballast. They are all rather heavily sparred, the length of the lower yards being usually 90 ft., and the topgallant-yards (double) 62 ft. The sister ships of the *Thracia*, the *Samaritan* and the *Howard D. Troop*, are remarkably fine vessels, both from the sailor's and the owner's point of view. It appears that the *Thracia*, after completion by the builders, Messrs. R. Duncan & Co., of Port Glasgow, shipped 600 tons of ballast and proceeded in tow of a tug to Liverpool. She was off the Calf of Man on the night of the 14th ult.; it was then blowing a heavy S.S.W. gale with hard squalls. During a heavy squall she was observed to fall off into the trough of the sea, when the wind was hard on the bow. She gradually heeled over and sank with all hands. Such a catastrophe is sufficiently sad. It is as yet premature to express any opinion as to the cause of this disaster, but it would appear that the case is not dissimilar to that of the *Wilhelm Tell*. We have first of all a ship in ballast drawing but 10 or 11 feet of water, and exposing a tremendous area to wind pressure. We have great initial stiffness consequent upon the form of the hull and the storage of ballast in the bottom of the ship. The consequence is that the displacement is too small, the metacentric height too large, the freeboard absurdly excessive, the area exposed to wind pressure equally so. The vessel is then placed so as to cross waves approximately of her own length. She then rolls excessively, during a lee roll, assisted by the wind, an angle is reached exceeding

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the "angle of repose" of the ballast. This pitches away to leeward, and a capsize is the natural and inevitable result. The moral of the whole story is that ballast in sailing-ships should be trimmed evenly over the holds. It should be covered with planks which again should be "trimmed down" from the beams, so as to prevent any shifting.

FROM our valuable exchange, the *Scientific American*, we learn that during the next few months a great many bottles will be cast upon the shores of Lake Michigan. They are to be thrown into the water for experimental purposes by lake captains, who will undertake the service at the request of the United States Government. The experiments are to be conducted for the purpose of determining the set and drift of lake currents, and will be under the direction of the Weather Bureau. The bottles are to be given out to vessel captains, who will agree to throw them overboard and enter certain data on blanks furnished for that purpose. In order to do the work systematically, the great lakes have been mapped out in numbered sections, commencing at Duluth and numbering eastward. There are 410 sections in all, each containing about 180 square miles. When the captain throws one of the bottles in the water, he will place in it, before so doing, a slip of paper, upon which the data and the position of the vessel is entered. On each slip is the request that the finder send it to the chief of the Weather Bureau at Washington, or hand it to the nearest Government observer, lighthouse keeper, or postmaster, to be forwarded. By noting where the bottles go ashore, data will be obtained from which the movement of the lake currents can be calculated.

AMERICAN yachtsmen are still discussing the question of international racing as connected with the *America's* cup. In a long and able communication to *Forest and Stream*, Mr. Stinson Jarvis, who is a lawyer as well as a yachtsman, maintains that the trust deed imposing the stringent conditions under which English yachtsmen decline to race, is illegal. There are three separate deeds in existence, one executed by the four owners of the yacht *America*, which won the cup at Cowes in 1851. The cup came to them as their own property and not as a challenge cup, but they, in July, 1857, conveyed it to the New York Yacht Club as an international challenge cup. Any organised foreign yacht club was to be entitled to

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claim, through one or more of its members, the right of sailing a match for the cup with any yacht or other vessel of not less than thirty or more than three hundred tons, measured by the Custom House rule of the country to which the vessel belongs. Details of the race were to a large extent left in the hands of the New York Yacht Club.

In 1882 the cup was returned by the club to Mr. G. Z. Schyler, the only survivor of the four original owners, and he signed a new trust deed. In 1887, by a similar process, the present restrictive deed came into existence. Mr. Jarvis contends that the two latter deeds are illegal, and that the New York Club had no power to return the cup to Mr. Schyler, nor to do anything with it except to arrange for a competition in accordance with the terms of the original trust deed.

It would appear that similar dangers are resulting in America, from coast artillery practice, to those of which we have had recent experience in this country. *Forest and Stream* thus alludes to a case in its issue for 14th July:—"Within the last week a new form of water sport, already quite well known in England, has been introduced into New York, which, if it becomes general, will add considerably to the excitement of yachting. The only requisites are a large cannon of the most modern type, and a stretch of open water frequented by yachts, fishing vessels, and trading craft. In England the hulling and sinking of small craft by guns used in tests and artillery practice has become quite common, some lives having been sacrificed. On Saturday last, in testing a new 10-in. gun at Sandy Hook, one of the three shots fired passed completely through the hull of a coasting schooner, sinking her so quickly that her crew had barely time to launch the yawl boat. The crew were picked up by a steam-yacht. While this is the first serious accident, it is by no means the first instance of reckless firing about New York and the Sound by which the lives of yachtsmen and fishermen have been imperilled.

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PERSONNEL OF THE MERCHANT SERVICE.

IT is doubtful whether any solitary pen afloat is capable of dealing satisfactorily with this subject, for this reason, that no one pen has had sufficient experience of all classes of vessels. Let anyone consider what this means, and imagine, if he can, what manner of man it would be who had served in a position which would fit him to speak authoritatively, and as one who had been behind the scenes of all classes of vessels comprised in our merchant service! Marryatt could and did write for the Navy, and fairly too, if one may judge him by his success; but although he touches small craft occasionally, he is more at home in frigates and liners, the frigates especially. But take all our writers on the Mercantile Marine, and they almost always stick to one type of vessel; even here there is a difficulty; from thirty to fifty years ago the customs on board merchant vessels were very similar whether the ship was large or small. Writers like Cooper and Melville, having once mastered the technicalities of the sea and the characters of seamen, had little difficulty in adapting their ways and means to the end required; but take our last great and most modern writer on the merchant service, Clark Russell, for craft of moderate to small size and to any date up to a quarter of a century ago, he cannot be surpassed; but it will be noticed

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that he carefully abstains from anything of a more modern tendency; in fact, to use his own words, "the beat of the propeller knocks all romance out of his head." It would certainly take as great a master of romance as Mr. Clark Russell to find a scrap of such a commodity in a modern steamer, but his words express a truth which even he perhaps did not discern when he wrote them, which is, that the profession of the sea is so changed, that no one person knows enough of it in its entirety to master or deal with the subject in detail. The man who did possess the information, if one existed, would be a fit subject for careful preservation, with a view to consulting him as an inspired oracle; though it is also probable, that as the oracles of old had an aptitude for saying unpleasant things at times, veiled in extremely vague and safe language—this modern one would not be wearied by too constant appeals to its wisdom.

As, therefore, it is contended that this subject is a patch-work, which must be completed by many hands, this article is one contribution thereto concerning southern-going ships, or those mostly employed on the long ocean routes; and it is the result of thirty years' experience of a sea life, fifteen of which have been in command.

At the outset it may be asked, What is the proper designation of the life spent at sea in command or subordinate command of merchant vessels? Is it a trade, or is it a profession? Without being able to quote any authority it will, I think, be admitted that there is a phrase constantly in use, and accepted as true, that "masters and owners of vessels are regarded by the law in the light of common carriers," and from the legal point of view this may answer well enough; but the knotty point remains, that the common carrier is irresponsible to anyone save his employer, but the shipmaster or officer is accountable to the State for any wrongful act or default on his part. The carrier may run the wheel of his waggon against a lamp-post and break an axle—he can be discharged summarily, and the next day employed again by someone else, who might say that every driver was liable to accident. Not so the shipmaster. If he runs his wheel against an outlying danger he commonly does more than break his axle. In many cases it runs to hundreds of thousands of pounds, and it would not require very much imagination to make it even more; but admitting the accident in both cases—the carrier puts his wheel against a lamp-post and damages his vehicle, the shipmaster

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puts his ship on, we will say, the Fastnet—now where does the similarity of responsibility come in?

In the first case, Jehu, with his van of merchandise, collides with the lamp-post, either by error of judgment or force of circumstances; he is stranded and remains until assistance reaches him, and there is no harm done save the expense of a broken van, and the delay perhaps of a basket of salmon that should have been in the hands of a cook in time for a city magnate's dinner. What is the result of an error of judgment or force of circumstances in the other case? It means certainly great loss of property, in all probability, loss of life in addition.

The primary fault or faults in the two cases quoted are exactly similar, they are either misfortune, error of judgment, or force of circumstances, for it will perhaps be admitted that wilful wrong-doing may be left out of the question; the punishment of the van-driver (optional on the part of the employer) is dismissal, which very possibly means employment elsewhere on the morrow; on the part of the shipmaster it means suspension of certificate, and a heavy bill for legal expenses.

In each case the offender is a man. Pickford's driver has to show that he can read and write; little more is required from the shipmaster as to educational requirements, but the other qualities expected and demanded of him are vastly different; in one important particular he stands alone, for he is not permitted to make a mistake without experiencing the severity of the law. A doctor may mistake the malady he is treating a patient for, and discover his mistake when the *post-mortem* takes place; a lawyer by carelessness may lose his client's case, and entail an endless loss of money; a civil engineer may plan and construct a railway viaduct, which blows down and kills lots of people travelling in a crossing train, but these men are members respectively of a *profession!* and having time to perfect and elaborate their plans and arrangements, are duly licensed to squander or kill, if it is discovered too late they have made a fatal mistake. These men have time to think, to consult if in doubt, to look up books of bygone cases, to reverify strains, &c.; and in consequence, if they make a mistake, are sympathised with in every direction by their friends. Is it so with the shipmaster? No! He habitually sleeps with the care on his hands of property as large as any heretofore mentioned as belonging to the learned professions; in addition, he has the *personal* care of the property itself, and

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if *momentarily* he is called upon to decide upon a course of action and makes a mistake, this one lapse of judgment is a stumbling-block in his path for ever. This is no exaggeration; the keenest intellects in England may be seen any day engaged in trying maritime cases which had to be decided momentarily by the man on the bridge. Every point will be argued *pro* and *con.*, but not the smallest regard will be paid to the initial cause of the disaster, *i.e.*, the man on the bridge. Turn him out; he is the mere cause; the effect is that which is appreciated by both counsel and solicitors.

But when it is understood clearly what are the responsibilities habitually undertaken by the shipmaster, it is impossible to refuse recognition of the fact that, as a rule, neither is his education sufficient, his social position that which it ought to be, his remuneration fair, nor his treatment in his hour of trouble either fair or in keeping with the traditions of common justice.

It is to be greatly regretted that there is no common standard laid down by which all ships would be governed. Each company of good standing has its book of regulations, which are more or less strictly adhered to; but in large steam-vessels on long voyages, a very great deal must be decided by the personality of the master and officers; and it is beyond all things essential that they should pull together. As to the degree of intimacy which should exist between them, it may be presumed that there is a wide divergence of opinion. Why is it that there is never the same freedom from restraint at a naval mess, which is commonly found at all military messes? The answer to this question is perhaps on these lines, but in them the self-assertion of the sea shows itself strongly, and demands in no uncertain voice a habit of life which must be in consonance with its traditions, in spite of steam—the leveller of all things. I quote as *apropos* of this, an extract from one of the most remarkable of all naval works, Mahans' "Influence of Sea Power on History." Speaking of the difficulty experienced in maintaining discipline in the French Navy about the year 1770, he says: "Under Louis XVI., the intimacy and fellowship existing between the chief and the subordinate led the latter to discuss the orders which were given him. . . . The relaxation of discipline and the spirit of independence were due also to another cause than that pointed out; they can be partly attributed to the regulation of the officers' messes. Admiral, captain, officers, midshipmen ate together, everything

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was in common, they "thee" and "thou'd" each other like chums. In handling ship the inferior gave his opinion, argued, and the chief, irritated, often preferred to yield rather than make enemies. Facts of this kind are asserted by witnesses, whose truthfulness is above suspicion" (Froude, "Batailles Navales").

In a military life the colonel of a regiment and the last joined subaltern are, generally speaking, on good, and it may be easy terms of familiarity, because, when business is over for the day, as in times of peace, they can get away from one another; if they meet socially, there is little or no restraint, save that which is natural in a newly-joined sub., caused, if he be a right-minded sub., by the feeling of awe built up by regimental tradition for his chief, and even at mess he sees that apparently that barrier is broken down; the appearance is, though apparent, not real, as he discovers in time. But on board ship the state of things is not at all similar; it is as though every man was always on duty, and there is no relaxation of the bonds of discipline. Take, for instance, a battalion of infantry on Southsea Common manœuvring. The colonel or officer carrying on the drill may perhaps shout in a voice loud enough to be heard on the pier, "Mind where you are going, Major!" and in all probability the officer so addressed feels somewhat put out; but in an hour's time he has got over his annoyance, and before mess time, has had so many things to distract his attention, perhaps socially, that he has well nigh forgotten the occurrence, or, perhaps, lets it off with "So and so was a bit keen this morning." In a ship, however, there is not this getting away from annoyance, and in some of our recent war-vessels, where, by reason of cramped accommodation there is but one general mess, people will be obliged to sit down together who have fallen foul of one another in matters of duty throughout the day, and have not had time or opportunity for the social relaxation necessary for the entire restoration of good feeling. At sea, by reason of being *always* in presence of one enemy, treacherous salt water, there is always that foe to be guarded against, and consequently routine must always be observed, which touches everyone on board, from the highest to the lowest, but still is regarded as necessary, and the best face put upon it.

The manner in which the foregoing remarks apply to the merchant service is thus: Unlike the Navy, the officers of which are more or less men picked and weeded in many complex fashions, we merchantmen are more or less always a

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scratch pack, drafted from many different kennels; we are all meaning business, but our ideas on the subject are extremely dissimilar. The old saying, "different ships, different fashions," applies with especial force to the merchant service, and a routine adopted by one company or ship, however good it may be, is not always a recommendation for its adoption by another where personal jealousy or dislike may be an important factor on the side of an administrative power; in point of fact this is carried to so great an extent at times that in certain services it may be said that under any conditions officers are not interchangeable.

At a paper read before the Shipmasters' Society some little time since, Captain Hutchinson, of the British India Company, made the remark during the discussion which followed: "That socially masters and mates were on a par, and that the junior mate was *off duty* the equal of the master." This is quoted roughly from memory as it made an impression at the time it was read, and if it were possible to do so this paper should accentuate those remarks, but it is a hard and an uphill game to play. There have been and are ships where this has been understood, and where the work has been child's play in consequence. Doubtless, readers of these lines can look back on such ships with regret for times they may regard as past and gone. There is, however, no reason why this should be so; those ships were happy and well managed, because the men in them understood that work was work, and play was play, and if an officer got a slating on a matter of duty it vexed him, doubtless, but he did not regard his superior as a personal enemy in consequence; and with men of education, sense, and no inherently vicious qualities this will always be so; if officers will take interest, both carefully and intelligently, in their work, and, instead of doing as little as possible, try how useful they can make themselves. In this matter no question of pay comes in, the master, officers, and engineer officers are all in the ship together, they are at sea and their well-being and happiness are in a great measure in their own hands, and for their own interest they should endeavour to make things go smoothly.

But it is a state of things difficult to obtain, unless they all *start* on the footing of social equality, and there the question of original or primary education again crops up, and remains, as it always has been, the "Dweller of the Threshold" that bars the way to all serious improvement in our Mercantile Marine. Yet the number of young gentlemen who yearly pay

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premiums and go to sea in merchant vessels is very large, and should have, by the number of years it has been so, made more mark than is at present discernible. If the premiums were saved and expended in the *Worcester* or *Conway* previously to the boys going to sea, they would, in the writer's opinion, be better expended, even though they (the boys) went to sea before the mast to economise afterwards. A boy, on his *first* separation from home, requires as much sound educational and proper principles as can be instilled into him.

A great deal has been written lately on the subject of officers leaving the bridge to do work which is considered necessary, or to clean bright work, or a dozen other things of a similar nature. This article does not deal with ships of that description. It is here considered and laid down as an axiom that the bridge is *never* to be left at sea without an officer in charge, and it may here be said that *no* steamer is seaworthy unless she has an officer on the look-out, whether by night or day; and, furthermore, this is a point which can be settled by masters and officers without any outside intervention whatever, they *must* help themselves.

Oh! gentlemen, who write about training colleges for the merchant service, are you not a little before your time? *or* do you intend to make them give rudimentary instruction? If the latter is the case, good speed to you; teach men to be helpful, self-reliant, with a knowledge of the power that lies in the hands of every man in command, for better or worse, and disabuse them of the idea which now possesses them of their own helplessness and inability to say their souls are their own. Let us at present do the best with what we have. They, the present men, have little time for more than their cram to obtain certificates; they cannot afford it. Let the present lot get their education as best they may, and let us begin with the new in a different manner; for those that are, let them do their best and trust to Providence.

Is this language too strong? Scarcely! Some remarks on the tenure of the master will be made later on; but although this article is supposed to deal principally with the larger and better class of southern-going steamers, even here these remarks will in a great measure be relevant; for suppose a large steamer were down to her marks, and loaded a foot by the head, would any master, save in an exceptional case, refuse or object to take her to sea, although he knew perfectly well that by doing so, if he met with a gale of wind immediately, he

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stood a good chance of losing her. The writer, unfortunately, or fortunately, is tied by the fact that he is still afloat, and so subject to even-handed criticism. Well, it is to be hoped that his brother mariners will give him credit for *bonâ fides*. If no one does anything, the work stands still, and it is the duty of every man to pay a certain debt of gratitude to his profession. Moreover, this paper is to a certain extent written by request, and if in the future the writer makes a mess of his vessel, he is prepared to abide by his own criticism; but again I say it is written with all good feeling.

But to return to the officer of the watch. Did any reader ever hear an expression used, "Naval Apery"? If not, and many have heard it, it means copying to an absurd extent in a merchant vessel the manners and customs of the Royal Navy, so as in fact to caricature them, mostly taking, not the shape of increased efficiency, but simply outside show and display. Well, it may be harmless, but it is misdirected energy; but the endeavour in itself to copy the efficiency of the Royal Navy is not misdirected; it is simply endeavouring to attain to the highest possible standard, for when everything possible is detracted from our Navy, it remains the biggest and best steamship company in the wide world, and in the regulations laid down for the proper and efficient navigation of those ships, one chapter is devoted to the duties of the officer of the watch.

There is little doubt that that chapter was inspired by the collective wisdom of men who had done their respective parts in maintaining the supremacy of our ships on salt water, and the fact that they did so, entitles their opinion to every deference which can be shown it, for they must be judged by their success, and although the conditions that obtain are, it is needless to say, widely different in the two services, yet on certain broad lines they converge, and it is impossible to separate them—for instance:

"He is, when officer of the watch, responsible for the safety of the ship, subject, however, to any special orders he may have received from his captain.

"He will at all times when at sea, as far as practicable, keep himself informed of the position of the ship, especially when approaching land, or in pilot water, whether land or lights are in sight, and if not, whether any are likely to be seen, and *all* particulars which may be of use in keeping the ship out of danger.

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"He is never to change the course without directions from the captain, unless to avoid immediate danger.

"He is to take pains to instruct the *midshipmen* and the *men of the watch* in their respective duties, pointing out any mistakes that may have been made in the discharge of them, and how they should be avoided in future."

Take the first clause, which says that the officer of the watch is responsible to the captain for the *safety* of the ship. It means simply that the officer of the watch is the captain's representative, and should know when he goes on the bridge to take charge, if in narrow waters, the position of the ship on the chart, and what he has to look-out for in his watch. He should take an intelligent interest in this, and supposing he were in doubt, and the master was not in immediate attendance, he should be prepared with measures for the *safety* of the ship, and it is usually pretty easy to play for safety. Pains should be taken to make him feel his responsibility; the constant presence of the master on the bridge removes all sense of it, and causes officers to take things more easily than they would otherwise do. An officer with a mate's or master's certificate ought at any time or place to be able to take charge, and play for safety if necessary. It seems preposterous to mention it, but how can an officer be responsible for the safety of a steamer, if his watch on deck is occupied with work, I will not say duty, which takes him from the vicinity of the bridge? It may be said that in small steamers or cargo steamers the master should look-out in the daytime; this is an untenable position, for the master is supposed to be at all times about, either by night or day as required, and to impose any one duty on him in particular, is in every respect a mistake. Routine should not stop through any forgetfulness on his part. Take for instance the winding of chronometers; if the master were to make this his duty, and he forgot it one morning, the probability is that no one else would discover the fact; but if the second officer habitually did so and then reported to the master with a book to be initialled, the check is valuable and security doubled. Another reason against the master assuming any particular duty is that should he fail in it through forgetfulness there is no one on the spot to call him to account for his lapse of duty, however important it may be, which is not the case with an officer. This is merely mentioned because in the pages of this magazine one frequently sees references to officers being unable to look-out and do ordinary navigation duty in their watches on deck in

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consequence of their being needed to do other work. The remedy for this lies in the master's hands. If there are not men enough to do the work let it remain undone; but at all hazards the watch on the bridge should be maintained. Of course in large vessels carrying passengers the officer of the watch has to keep a general eye over all that goes on on deck, both as regards order amongst the passengers and the many other things that constantly crop up with a large ship's company. He at least clearly understands, or should do, that he is, during his watch, practically the master; but this confidence is not, I am afraid, general; and where so much is left to individual caprice or fancy, as must necessarily be the case in the merchant service with its various types of shipmasters, one common style of working is not an easy matter to arrange.

There was a large *new* steamer wrecked a short time since; names are better not mentioned, but it was her first voyage. The enquiry, when held, exonerated the master from all blame; but incidentally the question was asked, When was compass error last obtained? The answer was about a *month* previously, in a very different latitude and locality. Now, it would be a matter of interest to ascertain what the various officers were about during their watches on deck, if no amplitudes or azimuths were taken. The officer of the watch should be quite conversant with the ship's deviation curve, and habitually testing it with his obtained compass errors, and above all the chart should be always accessible to him when in the vicinity of land. If under these conditions he does his duty he has no time to leave the bridge for manual labour.

And if a modern steamer or sailing-vessel cannot pay without manual labour on the part of her officers, the sooner she lays up the better for all persons concerned; for what greater danger is there than a tramp steamer with a bad look-out? a misery to themselves and a constant menace to all in their vicinity. If they will not pay with a decent and sufficient crew, the trade cannot be worth having; but as long as ships go to sea they should be properly manned; and if it be said that to lay up ships would be to throw men out of work, the reply is that there would still be lots of ships for British seamen, and let the foreigners, both masters, mates, and men, pack to their own countries, and the sooner the better. This is not improbable, either, *if* some effort is made to get a larger number of British seamen.

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But care will be required to keep officers up to the mark if once they become thoroughly emancipated; no work, or work that can be slighted, is worse moral training than too much work, and laziness and *slackness* are not qualities that go to the making of a good officer; but no matter what the ship is, the constant work of one man is to look-out for her, and if he sees that the men of his watch show a fair amount of expedition and diligence in the discharge of their work, the officer of the watch will have done his duty and fairly earned his pay; and *if* he will but have taken sufficient pains to keep himself so posted, that, if by an accident he was suddenly placed in command of the ship, he would know where he was, and all about it. In the matter of giving instruction both to junior officers and men, he should remember also that he has no reason or right to expect that all his people should be accomplished seamen; he must do his share in producing the real article for the use of other men, as his predecessors have already done for him. Patience and good temper under these conditions are invaluable, but they are all too frequently conspicuous by their absence, and trying indeed is the position of any man who knows what is necessary and wishes to do right, yet fails in these qualities. They are a growth of early cultivation, and if temper is let loose in early life it seldom improves as years roll on, and example carries so much more weight than precept. This and all kindred subjects are part and parcel of that higher education that is being cried aloud for. Supposing that training colleges for officers were, however, established, is there any proof that officers would attend them? My own idea is that generally they would not get much attention from officers, because they would be unable to spare time from their daily duties, or else would lose their pay; *but*, if there were State Colleges for officers of the Mercantile Marine, on somewhat similar lines to Greenwich, where the examination of masters and mates for the higher grade of certificate—that we hope will be established—will be held, and compulsory residence insisted on previously, there would be something in it. But the outlook is not reassuring, for unless a boy were well-grounded before he went to sea, too much time would be taken up with elementary matters. And seeing that there are yearly eight vacancies at Greenwich College for merchantmen, it would be interesting to discover how often the privilege is used.

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What have we afloat? Fifteen thousand vessels, roughly speaking. Well, then, there is an apology due from the writer to every master in command, if any words here written wound in even the smallest degree, and unknowingly, the susceptibility of any one of them; but if brother shipmasters will pick out the weak points, and agree on them from their varied standpoints, this paper will perhaps not have been vainly written.

The aim of shipowning is to earn money. That is its *raison d'être*. Incidentally the fact of money being so earned causes a vast distribution of it amongst people employed in the navigation of those vessels, and in the many trades necessary to render their equipment both complete and effective, and when once the vessel is turned out of dock, loaded and equipped for her voyage, the master, properly speaking, is the owner's representative, and should take all further responsibility until her return to her home port. The term "properly speaking" is used, because in some trades in which the same vessels are regularly employed, agents are appointed, who in many cases, on the arrival in port of vessels accredited to them, take over, or profess to take over, all responsibility from the master, and wish to stow, and send again to sea the vessel in a condition suited to their ideas, whether they be right or wrong, and completely ignore the master, regarding any interference on his part as uncalled for and unnecessary. Now, pages might be written on this matter, and the end still be as far off as ever, so it is not proposed to say very much on this subject; but what is said will be, it is hoped, to the point.

Esau was hungry and sold his birthright for a mess of pottage, in precisely the same manner as that in which we have sold ours. We have given up our safeguards one by one; we have signed blank forms, and probably the Custom House is the only place where the presence of the master is absolutely necessary previously to a vessel leaving for sea; we have permitted, through the weakness of our own executive, vessels to be loaded, or badly loaded, or overloaded, and in many cases have had the satisfaction of paying for the same to a very good, though wholly inadequate, tune. In other words, we permit anyone to load our ships, and pack them to sea in a manner, frequently including both crew, lading, and equipment, which, satisfactory to the shore mind, is the reverse to the people *en route* to sea from the docks. And how has this state of things been brought about?

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As was previously stated, ships are primarily money-earning machines, and for the purpose of this argument I shall assume that a bank, say, the "National Provincial," is another, and then contrast the position and pay of a branch manager and the master of a decent tramp. Having done so, ask which is in the position to lose most money by incompetence or misconduct. This may appear an exaggeration. It is not in the least. A tramp steamer, value, say, £30,000, and cargo to a similar amount (this is putting both at a low figure), and that represents the value the shipmaster is responsible for night and day; at sea or in narrow waters, always has he the care of that amount of *property or value*, to say nothing of human life. This is not even intended to apply to the larger and better class of steamers; they are left out of this argument altogether, because there can be no comparison.

Where is the branch manager of any bank who has the chance of losing sixty thousand pounds in one night by an error of judgment? His specie, if it amounts to that sum, is safely deposited in his strong room; he is under the immediate eye of the police, and if in doubt as to a matter of business in the daytime, is within telegraphic communication with his inspector or manager; in fact, it would require a considerable amount of ingenuity on the part of any branch manager to get so far to the wrong side. Yet, contrast the remuneration received by the two men, both assumed correctly to be in absolute charge of the *same* amount of property.

The reply to this, of course, will be: "Oh! the bank manager is an educated man and a gentleman, and the tramp skipper is not." Well, *perhaps*, the skipper is not a gentleman, although many are, and educated ones at that; but the hard fact still remains that both the men are in charge of the same value in property, and possibly, the two here compared might have been fellow schoolmates. But the manager went to sit in an office as a boy, "he stuck to his desk, and did not go to sea." The other did; he had the sound of the sea born in his ears, and as well educated as his fellow, started out with a light heart and bright buttons on a career, which, although it is the source of England's greatness, has of late years been anything but a paying speculation to the men who take to it.

How comes it then, that given two boys of equal attainments and merit at the age of fifteen, both engaged in a mercantile pursuit, one at the age of forty is in the receipt of £1,000 a year, the other perhaps £300 to £400 only?

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How many men pass the extra master's exam. ? and why do the majority not trouble their heads about it? Because it is of no earthly use to them, not being compulsory, and there is not a case on record of its having gained a man an extra shilling. Most steamship masters will pass in steam, because that is useful at times.

How many years is it since first the cry was raised to raise the standard of the Board of Trade examinations? and why has it not been done? Because the Board of Trade *dare not do it.* The words look curious in writing, but they must remain, and, moreover, they must be justified.

A proposal has been formulated, and it is believed, has found favour with the Board of Trade, that there should be three grades of shipmasters, the lowest of which was to be the present master's examination, suitable for the smallest class of vessels, the two others to be respectively commander and captain, with penalties attached to the improper use of either title. If it were then made compulsory for certain vessels to carry specified masters as to rank, all questions as to education of Mercantile Marine officers would vanish, for they would not be so plentiful, and would command good pay. If in addition to this it were enacted that no foreigner or other than a British subject could command a British vessel, things would look up in the merchant service.

Now comes the question, Will any shipowner say one favourable word for such a state of things? Lots of them will be vastly philanthropic on a *Worcester* prize day (and *Worcester* boys generally are the sons of gentlemen, who, if they are lucky, have now a prospect of four hundred a year until they die, from the time of obtaining command) or on a similar occasion. But let the Board of Trade consult a deputation of shipowners as to raising the standard of examination, or the exclusion of foreigners as masters, and what would the answer be? An unhesitating negative.

So that it resolves itself to this: Either the cry for education is a sham, because it is not a marketable commodity in the merchant service, or shipowners must be prepared to pay for it. Is it reasonable to expect educated youths to qualify for a calling which, as a rule, is abominably paid in the higher ranks, in consequence of the enormous competition caused by inadequate examination and qualification?

These remarks have been made on the assumption that higher education for officers of the Mercantile Marine is

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necessary. It is not necessarily a declaration of faith on the part of the writer, who, however, does hold that a British shipmaster should be capable of something more than working out a set of sights, and taking his ship into port.

It is strange that this business is not attended to by the people most concerned in the matter—that is, the underwriters, who have everything to gain apparently by increasing the education of officers; but it is presumed they know their own business best.

Companies that could be named do not insure their vessels; they pick their officers and stand the risk—it pays!

The risk of collision with either ice or another vessel is probably the only risk in a well-found, fairly loaded and properly manned steamer.

But if vessels were not lost no one would insure, and where then would be the insurance business?

But when, we will say, a steamer becomes a total wreck, worth with her cargo perhaps a quarter of a million, within a mile of a light, which the master says he *thought* was six miles off on a clear night, even an underwriter might justly ask, "What right had the master of that steamer to *think* how far he was off? There are methods enough in vogue for finding the distance. Why did he not know? And on this question of insurance hangs the very entire matter—it is the beginning and the end of the business.

The writer and a very large shipper of produce were one evening alone at a colonial club dinner-table; the conversation turned upon the respective merits of well-found mail steamers or tramps for a certain very stormy route. It was pointed out that a well-built and well-found ship was necessary for safety. "Oh!" said the merchant, "that does not matter, we can always insure." The writer then observed that he intended to reproduce the conversation, and he now does so.

Now that man was possessed of the greed of gain to a great extent; he was prepared to gamble with loss of life, and that, I suppose, is commercial morality. If the inducement or opportunity of rendering themselves safe under any circumstances is placed in people's hands, it is to be supposed they will use it as occasion offers.

Mr. Chamberlain, years ago, put his finger on this weak place, but the interests involved were too many even for him. The situation is summed up in two words—Limit insurance to a short two-thirds, both of ships and cargo, and prohibit the

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insurance of freight altogether, except in case of total loss through collision.

By this means we should stop, once and for ever, all question of overloading, and the various other matters that have been tinkered at for years past.

The shipowner then is face to face with pecuniary loss if his ship goes a-missing. It will be admitted that risk of collision is the only serious risk encountered by a well-found steamer, and where is the injustice to anyone?

It is useless to look back upon, and talk of the relations that once existed between owner and master; at present they are destroyed in a great measure, and in face of agreements such as are in existence, it is difficult to understand how such practices can obtain. I am speaking now of an agreement published a year or so ago between a large London firm and the master of a Mediterranean steamer, and regret I have no note of it here to refer to; but it could scarcely have been a more disgraceful document, and completely bound the master in terms of slavery. The case is not singular, and it is not uncommon to find masters with reduced pay for the days in port whilst on a voyage, receiving only full pay when at sea; and it is for this state of things that young gentlemen are sent to sea, and require higher education. Of course these are extreme cases, but it is necessary to mention them to show that shipmasters require some little emancipation from one quarter or another, though far better would it be should they emancipate themselves.

The tenure of the master is another point requiring consideration—it will however wait; but it is easy to understand that a master, not afraid of losing his berth, might be intractable at times, and instead of paying fines for overloading, would play fairly by his ship and crew.

In the meantime the question remains: Will the officers of the Mercantile Marine combine to raise the status of their vocation to that of a profession, or will they remain content with the comparison to a Pickford's van driver?

WM. CAIUS CRUTCHLEY, Master Mariner.

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BRITISH SEA FISHERIES.

AN ancient adage hath it that Amsterdam is built upon herring bones. At least, such is the traditional cause to which the Dutch trace back the growth and prosperity of their commercial capital. Although our fishing industries have not played so prominent a part in building up our mercantile greatness, yet as a source of food supply they are of the very first importance. The fish taken off the British coasts during the year 1891 shows a falling off, so far as quantity goes, as compared with the total capture during the previous year. The quality, however, was good, and the high prices realised show that the extension of the market for fresh fish has created a demand which British fishermen can hardly hope to supply, even in the most plentiful seasons. Off the English coasts the quantity of fish captured was 5,966,076 cwts., against 6,100,630 in 1890, and this total again was less by 364,000 cwts. than that taken in 1889. The value, however, shows no diminution in spite of diminished quantity. Thus, for the three years 1889-91, the value of the fish caught was £3,862,389, £4,368,552, and £4,491,010. The shell fish taken in the same periods realised £306,541, £374,060, £379,554. In Scotland the quantity of fish taken during the past year showed a decrease of 430,282 cwts., but it fetched an increased price of £137,148. The totals for Ireland rank much behind these, reaching only 621,394 cwts., valued at £301,885, while the shell fish taken in the same period was sold for £13,069.

The changes which have made themselves felt upon the shipping industry have already begun to influence the fishing business. Thus, iron and steel are gradually replacing wood as a constructive material for fishing craft. Steam power, too, is ousting a large number of sailing-vessels from the fishing fleet, though to what extent the introduction of steam will be carried it is hard to say.

On the south of England these changes have not operated to any material extent the conditions under which the fishing there is prosecuted, being practically unaffected.

The growing tendency of iron to supersede wood in the building of fishing craft is shown very clearly by the number of vessels of each material that have been constructed at Hull and Grimsby during the past decade. Thus, at the latter

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place there were built of wood 426 fishing boats, against 131 of iron. At Hull the figures were 157 wood and 155 iron. The majority of these iron vessels have been built within the past few years. Thus, for Grimsby each year's totals read—

Wood	...	50, 46, 61, 74, 91, 39, 25, 10, 17, 13 = 426.
Iron	...	3, 6, 8, 11, 4, 4, 9, 15, 17, 54 = 131.

At Hull the figures are still more striking—

Wood	...	17, 22, 29, 39, 19, 12, 10, 3, 3, 3 = 157.
Iron	...	2, 1, 1, 18, 12, 7, 14, 15, 27, 58 = 155.

Many a wooden fishing vessel, now manned by a Norwegian, Danish or Belgian crew, was a few years ago enumerated among the British fishing fleets; her original owners having sold her with the intention of replacing her by a boat of iron.

Steam is held to have done much to bring about the decay of the apprenticeship system in the British Mercantile Marine. Probably the same cause has operated to bring the binding of boys to the fishing trade into ill repute. Certainly the system is on the wane, and the "boys" promise to become ere long an extinct feature of our fishing service if the present decline is continued. At the close of 1891 the number of apprentices at all the English ports was 1,625, or 47 less than the total for the previous year. The average number of boys apprenticed during each of the past ten years was 533. Last year the number of fresh apprentices fell to 365, a decrease of 90 on the total for 1890. This declension of a time-honoured custom which formed the principal means by which the crews of the better class vessels were recruited, has made itself most felt at Grimsby. Here the system used to flourish, and "boys" to the number of 400 used to be engaged each year. Steam, however, must not be held wholly responsible for the change. Many smack masters are warm supporters of weekly engagements. A hand can then, if he turns out unsatisfactory, be discharged at a short notice. Under the old *régime* the apprentices were by no means the best behaved of youths. Too often, as a consequence of their proneness to disobedience and desertion, their hand was against everybody, and everybody's, as a natural consequence, was against them. Often they would wilfully damage the vessel in which they were engaged, or, failing this, destroy gear solely for the purpose of causing the smack to return home before the time at which the master proposed to close his trip. Many masters sought to maintain discipline with a high hand, and ill-usage was but

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too frequent; so that it is no wonder the youngsters indulged in reprisals whenever they could be ventured on with impunity. Much of this is now changed, the boys realising that they have only to lay a complaint with the Board of Trade officer and an investigation follows. With the diminution of the traditional ill-usage to which the apprentices were subjected wilful damage has declined, and the whole moral tone of apprentice life has become healthier in consequence.

Not only is the "boy" of to-day more law-abiding than his predecessor, but skippers and crews are also being civilised upwards. The working of the Technical Instruction Act bids to become a powerful factor in this tendency in certain districts. Hearty co-operation between Fishery Committees and County Councils will be necessary to ensure the fishermen the maximum benefit from the Act.

Northumberland has set an example in this direction that many other counties might follow with great advantage. Here the County Council selects six candidates, one from each of that number of the more important fishing stations, and provides for their instruction at the Marine School at South Shields. An allowance of 35s. per week is made, along with travelling expenses, and this ensures the pupil against pecuniary loss while going through the course. Each candidate pledges himself that on his return home he will, in the intervals of his ordinary occupation, conduct a class as a paid teacher, and thus impart to his fellow fishermen the wrinkles he has received. The curriculum is an extensive one, and calculated to be of the greatest benefit. Compass errors and their causes, the finding of latitude and longitude, the use of charts, the set of tides and tidal currents, buoyage and lighting, the Rule of the Road at Sea, the manipulation of the rocket apparatus, how to prepare a jury rudder and a sea anchor, how best to manage a small boat in heavy weather, and a knowledge of arithmetic—all find a place among the subjects upon which instruction is given.

At North Shields a course of cookery lessons has been given to fishermen with good results. The services of Professor Corsar Ewart were also secured, and lectures were delivered on fishing subjects at various fishing centres. As showing that these efforts to improve the professional status of our fishtakers are appreciated, it may be stated that at five centres where the audience were asked to select a subject, they chose, "The Migration of Fish and its Causes." At another station the

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lecturer was asked to discourse upon "How Fishes find their Food?"

If we go to the other extremity of England and see what is being done there, we find that Cornwall is just as keenly alive to the education of its fishermen as Northumberland is. Next year is to see the inauguration of the Truro Fishery Exhibition, to which fishermen and fishing apparatus from other parts of the British coasts are invited. The relative values of various methods will be practically demonstrated, and professional visitors should derive much benefit. The County Council, too, have voted the sum of £100 for lectures to be delivered during the exhibition.

All this points to an improved condition of things, and the British fisherman is certainly worthy of any efforts that may be made to improve his condition. His character for orderliness and general good conduct is second to none, and the patience evinced by the North Sea fishermen in face of the great provocation they have at times received from their continental competitors speaks volumes in their favour. The Fisheries Act of 1891 will, when its working is established, do much to minimise the intense competition between British and foreign fishermen, and will thus lessen the temptation to lawlessness. That part of the Act which deals with disputes between British and Belgian fishermen will be especially beneficial. Provision is now made so that every complaint of infraction of the Convention of 1882, or the Declaration of 1891, shall in the first instance be investigated and reported on by a Commission sitting in the country of the complainants. The complaint will thus only be forwarded to the Government of the other country if it is found to be well founded. The certificate of the Commissioners is accepted as *primâ facie* evidence as to lost or damaged fishing gear, and the certificate of an expert is recognised as evidence of the monetary value of the injuries so sustained. Witnesses may be bound over to appear either in Belgian or English courts, and each Government pledges itself to recover any damages which may be awarded against their respective subjects. There is one other provision of the Act which is worthy of mention, as it goes far to check the reckless spirit of reprisals which, unless it were checked, would do much to aggravate the relations between the different fleets. In case of damage, the suffering party must do all that lies in his power to minimise the mischief. Proof that he has not done so, or that he has

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directly or indirectly aggravated the injury, prejudices his claim for damages.

The claims which the Commissioners have to investigate occasionally involve considerable sums. Thus a fleet of English trawlers was stated to have damaged the gear of seven Dutch and four German boats to the extent of £1,735. Formal enquiry however failed to fix the offence upon any particular boat or boats, and the claim thus fell through.

British courts show a far greater spirit of leniency in the case of foreign fishing vessels poaching in British waters than our fishermen experience at the hands of foreigners. They know and expect but little mercy; thus a British vessel seized by a Danish gunboat near to the coast of Iceland had its trawl and fish confiscated and the skipper had to pay £3 10s. expenses.

Another English craft, seized by a German cruiser off the island of Nordeney, was taken to Wilhelmshaven, where the gear was confiscated, and the skipper imprisoned for six weeks. In another case the boat was released, but the fine and costs came to over £9.

Contrasted with these somewhat severe sentences, the seizures of foreigners in British waters have resulted in very light sentences. In one case, a boat fishing near Kingsdown, was ordered into Dover, but she escaped. Another, seized by H.M.S. *Frances* in the East Bay, Dungeness, was allowed to go free, but a penalty of £5 was imposed on the skipper.

The average death-roll among the crews of the English fishing fleets is 277; last year the number perishing at sea fell short of this total by nine. The particulars are:—

Lost by wreck	174
Fell overboard	45
Washed overboard	12
Knocked overboard by sails, &c....	18
Drowned from small boats	5
Drowned while fish ferrying	2
Natural causes or suicide...	12
Total ...	268

The gale of the 11th November, when the wind was south and south-west in the North Sea, and west in the Channel, produced a life loss of 42, while the phenomenal storm of the 11th, 12th, 13th of December, did little or no damage among the fishing fleets.

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From all parts of the English and Scotch coasts come complaints that fish, except perhaps herrings and cod, are scarcer than they used to be, and fishermen north of the Tweed grieve over the influx of English boats into Scotch waters. Prophesying speedy depletion if the over fishing which has been indulged in since the advent of the steam trawler continues. The plebeian sprat avoided, in anything like large quantities, during 1891, all parts of our coasts except the strip between Ramsgate and Folkestone. That puzzle to the student of natural history, the classic whitebait, shows a shrinkage from 1,049 cwt. in 1890 to 538 cwt. in 1891. Pilchards, too, were a failure. Seine nets were almost totally unproductive, and the drift nets were little better. Rough weather drove the pilchards or their food into deep water, where they were inaccessible. The failure of the seine fishing is attributed to the multiplication of the drift nets, which break up the schools of fish and prevent them coming in shore. The over-fishing of crabs is held to be another cause which has led this fish to abandon the Cornish coasts, infantile crabs forming a favourite food of the pilchard. This over-fishing and the wanton destruction of immature fish will come under the jurisdiction of the various Fishery Boards, and they can be relied upon to prevent so reckless a reduction of our fish supplies.

In the Bristol Channel the Cardiff fishermen allege that certain parts of it are entirely fished out. Thus the Cardiff trawlers, which sprang into existence a few years ago, have abandoned fishing and returned to towing again. Milford, however, flourishes, and no less than 36 steam and 100 sailing trawlers hail from there.

With regard to the slaughter of immature fish, no less than 70 tons were seized and condemned by the officers of the Fishmongers' Company, London, during the month of June. Such fatal recklessness as this would soon depopulate the most teeming fishing areas. The total amount of fish condemned as unfit for food in the London markets during 1891 was 1,014½ tons.

We have alluded above to the invasion of the Scotch fishing grounds by English vessels. A case in point is furnished by Aberdeen where, out of 73 beam trawlers which regularly landed fish there during the year, 36 were Scotch and 37 English. Herrings, however, are Scotland's wealthiest fish resource. The supply of this fish is practically constant, and

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during the past year no less than 852,715 barrels were exported, the Continent taking 796,345 and Ireland 36,457. The profusion in which the herrings abound in Scotch waters, and the care with which the curers endeavour to place a first-rate article on the market, have enabled Scotland to deprive the Dutch of the monopoly of supplying the continental demand for herrings which they so long held. But now British fishermen have a more formidable competitor to contend with in Norway. In certain seasons the Norwegian fiords simply swarm with herrings, and the hardy Norsemen are most particular in adopting the best methods of selecting, curing and packing the fish intended for export. Fortunately for Scotland, the supply is irregular, a wave of teeming plenty being frequently followed by a year of scarcity, and this is much in her favour. New markets are, however, much wanted for Scotland's produce, in the preparation of which 45,524 men and boys are employed in catching and 97,034 more in gutting, packing, and coopering. No doubt much of Scotland's success in the continental markets is owing to the genuineness of the so-called crown brands. During the past year not a single complaint was received as to the quality of any barrel bearing the Fishery Board's brand. These marks of guaranteed quality were re-arranged in 1890, and, perhaps, owing to this as well as other causes the number of barrels presented for branding showed a big decrease. Out of 270,701 barrels presented, 14,383 were rejected as not up to standard. The average number branded is 475,721. So great a falling off is owing in part to re-arrangement of brands. Then the season of 1891 was marked by a more than usual take of small fish. These small herrings which would not pass the Government requirements were sold mainly to Russia. A new trade-mark, introduced for unbranded herrings, is said to account for 80 to 100,000 barrels. The great success of the Scotch herring fisheries is due in no small degree to the extension of the telegraph system, which is used not only to spread news of shoals of fish, but also to bring the buyers in closer touch with the fishermen. A single instance will show the extreme utility of the telegraph in this direction. A shoal of herrings of exceptional magnitude was observed among the Orkneys; the local fishermen were apprised by wire of its exact whereabouts, and no less than £3,240 worth of herrings were caught in a single day. Wick was also advised of this enormous shoal, and the Wick fishermen shared in the catch. Gutters, coopers, packers, and

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supplies of salt were also wired for, and the result was that a glut of fish which years ago would have been sold to manure the land was packed and marketed without waste. The sister isle enjoys but few of Great Britain's facilities for developing its fish resources. It is not that the fish are lacking that accounts for Ireland's small contribution to our fish supply. The seas adjacent to the Irish coasts are well stocked, and the rocky recesses of the ocean floor abound with the most valued of the crustaceans. Before discussing the causes that operate to circumscribe the scope of the Irish Fisheries, it will be well to allude to the conditions under which the sea fishing is at present prosecuted.

By far the most important branch of the industry is the capture of mackerel. The total capture in 1891 was 308,581 cwts., valued at £149,617, against 501,943 cwts., realising £218,672, in the preceding year. Small catches of this fish are obtainable all the year round, but in spring and autumn immense shoals visit the coasts, and there is practically little limit to the numbers that might be taken. The largest catch of mackerel was obtained by the boats of the Baltimore centre. Here 36,527 boxes were taken, and realised on the average £1 per box. The fishing lasted from March to June, and engaged 240 first-class fishing-vessels. The fish was exported, save 100 boxes sent to Dublin and a like quantity to Kilkenny. Fifteen steamers were engaged in carrying the fish to England, and nine hulks were used for storing ice, of which commodity 3,230 tons were imported. In some cases the cost of conveying the fish to a centre from which they may be sent to England is very great. The cost of cartage or water carriage is thus an important factor in determining the price advanced by the buyers to the fishermen. The higher prices that are given at such centres as Kinsale and Baltimore are still farther increased by competition among the buyers themselves, and this the fishermen strive to reap the benefit of. This results in the sea areas adjacent to the important fishing ports being extremely well fished, the boats concentrating where prices are highest. Other districts equally well stocked, but further removed from the operations of the buyers and communication with England, were almost totally neglected.

The autumn mackerel fishery resulted in the capture of 46,055 cwt., about one-sixth of the quantity taken at the spring fishing. The total for 1890 was 95,173 cwt. The causes assigned for this great declension show how desultory

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are the efforts made to develop Ireland's finny resources. The major portion of the fish taken at the autumn fishing finds its way to the American markets as cured fish. Prices for this commodity ruled very low on account of rumours of the increased activity and success of the American mackerel fisheries. These rumours, however, though no pains were taken to prove or disprove them, were potent enough to cause the withdrawal of a number of the boats from the fisheries, and hence the diminished hauls. The schools of mackerel seem to have appreciated this partial suspension of hostilities, and visited the coasts and bays in enormous quantities. There is one factor that operates most powerfully against the growth of this important industry, and that is the gross carelessness of the methods employed in the curing and packing of the fish. These are in many cases most unscientific. A single instance will suffice. Much of the Irish mackerel sent to the American market is injured by the leakage of pickle on the voyage. This is caused by the faulty plan on which the casks are headed. The heads consist of three staves, and these should be placed vertically or standing upright when the bung-hole in the middle is pointing upwards. This method ensures a maximum of resistance when a barrel has to bear the weight of others placed upon it, for the stevedores at Liverpool and other places have always instructions to load barrels bung-hole up. The mode frequently adopted in Ireland is to place the head staves crosswise. Then the barrel is unable to stand the strain of a weight placed upon it, the sides bulge out, and the pickle escapes. It is to be hoped that the instructions which have been printed and placed in the hands of the Irish Fisheries Inspectors will speedily bear fruit and assist in the development of an important industry.

Faulty packing is not the only bad feature of the business. During 1891 the Government secured the services of a fish curer from Norway, who examined into and gave instruction upon mackerel curing. Among other reprehensible practices which he condemned were the two glaring faults of uncleanly methods and the indiscriminate packing of fish, *i.e.*, filling a barrel anyhow with fish of any size. As showing the care which the Norwegians take to place a thoroughly reliable article upon the market, it is well-known that they give the preference for curing to fish caught by the line. This ensures that the fish are hard in flesh, for those netted are often soft through the bruising they receive. The inculcation of these

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better methods is already producing its effect, for in not a few cases a great improvement is reported in the prices realised by the best cured Irish mackerel.

Lobster fishing is a profitable source of income. It does not monopolise so large a share of the fisherman's time, but that he can look after his tillage or engage in some other branch of fishing industry. The west coast is especially noted for its lobsters. Buyers are established at various places, and well smacks come from Southampton to all the more southern stations on the west coast. Until the present year these smacks were prohibited from visiting the French coasts, but now the restriction is removed, and Irish lobster industry may possibly suffer a little in consequence. There is no reason, however, why the demand for this dainty should not be extended. The British consumer has without doubt much to answer for. Many of the crimes laid at his door are more imaginary than real. Irish fishermen, however, have a genuine grievance against him, inasmuch as he has created a demand for the so-called "pea lobsters," *i.e.*, lobsters with their thousands of ripe ova attached. In Newfoundland, where the fish is caught for canning purposes, this ova is removed, hatched and returned to the water, and thus the unnecessary depletion of the waters avoided.

One of the greatest drawbacks to the extension of the Irish sea fisheries is the want of suitable fishing harbours provided with small slips, affording easy and adequate means for communication between the larger fishing-boats and the shore. In many cases the fish have to be landed through the surf and they suffer in condition in consequence. Over and over again have the Divisional coastguard officers borne record to the necessity for slipways and roadways. In many cases the fish is battered so that it is almost unmarketable by hauling through the surf or over the rocks. From the Ballyheigue Division, County Kerry, comes the following report:—

"Shoals of mackerel and herring have been observed in Ballyheigue Bay, but there are no proper boats or nets to catch them owing to there being no place of shelter. A pier would be of great benefit," &c.

From Brandon comes this recommendation:—"I beg to suggest that there should be a good light placed on the quay at Brandon. I have myself been on fishery duty on the 27th October, it being dark and about 60 canoes and other boats coming in with about 80,000 mackerel—on the 26th

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40,000. I heard the fishermen say, that if it was not for the light Mr. O'Neill placed in his window, they would have been on the rocks, not being able to see each other in the boats."

Natural harbourage there is an abundance of, and a comparatively little outlay would serve to render much of it available for fishing craft. A central harbour constructed somewhere in the vicinity of the Aran Isles and connected by a light railway with Irish systems would do much to develop the enormous fish resources of the seaways off the west coast. Galway is too far inland for a fishery station; much time would be lost in making it from the open sea.

From many places round the coast comes the news that the nets and fishing gear used by many of the fishermen are rotten and old, and that their owners continue to use them rather than go to the trouble of applying to the Government for the loans which are available.

Soundings and examinations of the sea bed which have been recently made off the west coast, show that to a certain extent a parallel exists between the west of Ireland and the coast of Newfoundland. The comparison, however, is in favour of the Irish coast, where the banks, *i.e.*, the clear patches of sea bed where such fish as the ling, hake and cod congregate, are much nearer the coast than they are off the Canadian island. There the fishing is mainly prosecuted from the dories, the schooners furnishing the temporary curing station an asylum in rough weather. Off the west coast of Ireland the costly schooners are not necessary as the small boats or smacks could easily make the land before bad weather culminated. It is quite possible that with an extension of harbour and railway facilities, quite a new feature in Irish fishing would be entered upon by working upon these lines. There is one more factor that militates against the development of these fisheries, and this is to be found in the spasmodic and desultory energies which the Irish fisherman in many cases brings to bear upon his work. This lack of steady perseverance is in a measure connived at by Nature herself. Occasionally there visit the Irish coasts such swarms of fish, that, to use an Hibernianism, "They shoulder each other out of the water." The most indifferent appliances are then sufficient to take large numbers of fish, and these abnormal hauls enable the fishermen to bear better the poorer catches of ordinary seasons.

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In one matter Ireland is much better off than Great Britain. She can supply her fishermen with ample quantities of bait. Railway development is, however, necessary before this bait can be properly distributed. Scotland has to import much of its bait, and her fishermen pay £20,000 annually on the railway carriage of shell fish alone for this purpose. The attention, however, that the Scottish Fishery Board have and are devoting to the restoration of the depleted mussel-beds will soon reduce this amount.

Such are the more salient features of the British sea fisheries, fisheries whose progress and development, so far as Ireland is concerned, are yet far from high-water mark. Much has been done in the past to educate the Irish fisherman, and to provide him with facilities for the prosecution of his calling. The £245,653 spent by the Commissioners of Public Works since 1885 has done much to supply good fishing harbourage, but much yet remains to be accomplished if the congested populations of our large towns are to enjoy at a cheap rate the teeming food supplies which inhabit the seas adjacent to the south and west shores of Ireland.

RICHARD BEYNON.

ROUND THE WORLD IN SEVENTY DAYS.

"ROUND THE WORLD." By arrangement with the Peninsular and Oriental and the North Atlantic Lines, the trip can now be made for £125—out by Atlantic and home by Suez, or *vice versâ*.

This paragraph, taken from the Canadian Pacific Railway Company's advertisements, brings forcibly before us the fact that British subjects can now start from home and "put a girdle round the earth," *travelling the whole way in British conveyances*, not perhaps in Puck's "forty minutes," but nevertheless beating the record of our old acquaintance Phineas Fogg. It is a thing to be proud of that Great Britain and her important colony Canada have achieved this great undertaking. It will be interesting and instructive to glance briefly over the route and the means of carriage.

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In this case we will follow the sun and "go West," for "westward" was the direction taken by those great explorers Magellan and Drake, the first circumnavigators. Our present trip will be made in such palatial vessels as those old heroes never dreamt of, who sailed away in their little cock boats, not knowing whither they went. As we start on our journey, we may see in our mind's eye the intrepid Magellan, having adopted the Spanish form of his name with his change of country, sailing away from S. Lucar on that September morning, 1519, having the previous day heard mass and confessed with all his company. And what a poor little fleet! and in such condition, too! "They are very old and patched," says Alvarez.* "I would be sorry to sail, even for the Canaries, in them, for their ribs are as soft as butter." The ships were five, their names and burden as follows:—*Santo Antonio*, 120 tons; *Trinidad*, 110 tons; *Conception*, 90 tons; *Victoria*, 85 tons; *Santiago*, 75 tons; probably three-masted, with the high poops and forecastle then in vogue, but poor little craft wherewith to brave the dangers of unknown seas. The ship we shall start in (taking the *toneles de porte* of those days to equal roughly our present ton, though they were probably less) is more than eleven times as large as the whole fleet put together. (Magellan's fleet = 480 tons; s.s. *Parisian* = 5,359 tons.) They did not take our present route, but, going by the Canaries, coasted down South America; discovered (or re-discovered) the Strait now bearing Magellan's name; navigated the Pacific; reaching, after many adventures, the Philippines, where, in a fight with the natives, the great seaman fell, as years after another great explorer was also to fall. We might follow the subsequent adventures of the remainder of the fleet, till on another September day—three years but twelve days after their departure from Spain—we should see the little *Victoria* with but eighteen Europeans, under the command of Sebastian del Cano, cast anchor off the mole of Seville, where these simple-minded heroes concluded their years of danger by walking barefoot to the shrines of S. Maria de la Victoria and S. Maria de Antigua, to offer thanks for their safe return. Thus the first circumnavigation of our Globe was accomplished.

Looking forward half a century, we might see our own countryman Drake sailing from Plymouth on November 15th,

* "Ferdinand Magellan." F. H. H. Guillemard. P. 119.

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1577, on a voyage which was destined to become the second circumnavigation, though not begun with that object. His fleet, though the same in number as Magellan's, was probably of less tonnage, though the vessels, belonging as they did to Drake and private friends, would be in better condition. They were the *Pelican*, 100 tons (whose name he afterwards changed to the *Golden Hind*, which was the crest of Sir Christopher Hatton, his patron); the *Elizabeth*, 80 tons; the *Marigold*, 30 tons; *Swan*, 50 tons, and *Christopher*, 15 tons. Following a similar track to Magellan, they navigated the strait in safety, but here a gale met them. They parted company—the *Marigold* was never again heard of; Winter, with the *Elizabeth*, deserted his chief and returned home. Drake went on alone, plundering the coast towns of Chile and Peru, and taking many vessels of the Spaniards, notably the plate-ship *Caca Fuego*.

Sailing on northwards, his intention was to seek a northern passage back to England, but after reaching 48° N., the severity of the cold determined him to follow Magellan's example and strike across the Pacific for the Moluccas; from thence he returned home by Java and the Cape, accomplishing the second circumnavigation.

The task which took these sailor heroes years to accomplish, we may now do in sixty-five to seventy days if we keep strictly to British conveyances; and, whereas their voyages were performed with all the misery and discomfort attendant on small crazy vessels, scurvy, and troubles innumerable, our trip may be performed in floating and running hotels replete with the luxury of the "end of the century." The Atlantic passage is so familiar to everyone in these days, that it is scarcely necessary to refer to it, except that, if we are to keep to British conveyances throughout, we must choose a steamer bound for a Canadian port. For this purpose, we shall take the Allan Line, and make our start from Liverpool in the *Parisian*—not perhaps such a flyer as the newest of the Atlantic greyhounds, but still able to make a very respectably smart passage with her speed of fifteen knots, and the run of 2,661 miles to Quebec, *viâ* the Strait of Belle Isle, will not take her very long, say seven and a-half days if she has luck. Another 140 miles will bring us to Montreal, and here our land trip, on wheels, will begin. The Canadian Pacific Railway takes charge of us here, and in about five and a-half days will carry us over the 2,906 land miles to Vancouver,—

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not a fortnight from England, and on the extreme western coast of North America!

Many of our nautical readers will be familiar with Quebec and Montreal—Quebec, with its walls and battlements, rising one above the other, crowned with the famous citadel, and, possibly more interesting to the merchant seaman, its great new docks, indicating that this city intends to re-enter the contest with Montreal for commercial supremacy in Canada. Montreal, rising from the broad river to the slopes of Mount Royal, from which it takes its name, a beautiful city, half French, half English, with its many churches, public buildings, long lines of immense warehouses, giant grain elevators and factories, and the great railway bridges spanning the St. Lawrence—all these things are familiar to many of us.

At Montreal, then, we start on our six days' run across country, 120 miles bringing us to Ottawa, the capital of the Dominion. Onward, through parts little known, till the Pacific line brought them into prominence, to Port Arthur, on Lake Superior, and again on to Winnipeg, now the capital of Manitoba. In 1871, as Fort Garry, its population was 100; it is now nearly thirty thousand.

We are already 1,424 miles from Montreal and into our third day of the journey across. The next places of consequence are Regina and Calgary, both towns in their infancy. Just before reaching the latter place we may, if it be clear, get our first glimpse of the Rocky Mountains. We are already at an altitude of over three thousand feet, and by the time we reach our highest point shall be two thousand feet higher. Gradually we near the mountains, till, at a station (Kananaskis) some 50 miles onward, they suddenly appear close at hand and, seemingly, an impenetrable barrier; a vision of wonderful beauty, culminating, high above, in dim, misty snow-peaks. The railway here crosses a river just above the Kananaskis Falls, whose roar we can hear as we pass. The mountains now rise abruptly in giant masses, streaked and capped with snow and ice, and suddenly a bend in the line brings us between two almost vertical walls of dizzy height—we are in the gap by which the mountain range is entered. Mile after mile we pass through scenery of stupendous beauty and majesty till at Stephen, some seventy miles further, we reach our highest altitude, 5,296 ft.

Our descent now begins. Still the rapidly-changing views are magnificent; we feel at every mile what a stupendous

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undertaking this railway is. Perhaps the most awfully grand part of the whole journey is the passage of the gorge beyond Palliser. Here the canyon rapidly deepens till the mountain sides become almost vertical, rising straight up thousands of feet and within an easy stone's throw from wall to wall. Down into this vast chasm go the railway and river (Wapta) together; the railway along ledges cut out of the solid rock, winding in every direction, and every little while appearing to plunge through projecting angles of rock which, till we reach them, seem to close the way. With the gigantic towering cliffs almost shutting out the sunlight, and the roar of the river and the train, increased an hundredfold by the echoing walls, this is a passage never to be forgotten.

Still we descend through varying scenes of beauty, till at Kamloops we once more reach a town, though a small one, and are again amongst smiling fields and signs of civilisation.

We are still over 200 miles from our terminus, but this is soon passed. At New Westminster we may be said to strike the Pacific waters, and only a few minutes more brings us to Vancouver, a town of some six years' growth, and already with a population of twenty thousand. We have reached the Pacific terminus, and now go on by steamer. We feel almost at the other side of the world. We have already crossed 120° of longitude, and are not yet a fortnight from Liverpool! Good travelling!

It is fifteen o'clock—our railway keeps the twenty-four hour time system. At Vancouver wharf, waiting only for us, lies one of the great white "Empresses."

If we intend proceeding we must go on board at once. Let us, however, take a look at our ship as she lies there with full steam up, half Vancouver out waiting to see her start. The three Empresses (of China, India, and Japan) are sister vessels, and very fine specimens of modern liners. Lloyd's gives their speed at 16½ knots, equal to 19 statute miles; very fair speed. They are 5,905 tons, steel, twin-screw, and 2,000 H.P.; length, 455·6; breadth, 51·2; depth, 33·1. Electric light throughout; steam heated for northern latitudes, and fitted with electric punkahs for more tropic climes. The arrangements are distinctly good; all the first-class accommodation being amidships, the steerage quarters at either end, and the second-class abaft the engines on the main-deck. As we go on board we are struck with the difference between these vessels and the Atlantic liners. In the build and general arrangements there

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may not be much difference, but other matters show that we are under a change. Our waiters are not "stewards," but "boys"; not in the black jackets and buttons of the Atlantic service, but in white suits; not Europeans, but Chinamen. Our mid-day meal is not "lunch," but "tiffin"; we find that when we want a waiter it is the thing to clap our hands, when immediately the "China boy" glides up like a white ghost to take our instructions. But our contingent of passengers is aboard; our lines are cast off, and quickly we gather way, and the wharf is left astern. For our first four hours we steam along a land-locked stretch of water, then stop at the mouth of Victoria's harbour for any passengers there may be from there, and then we at last reach the broad waters of the Pacific.

Vancouver to Yokohama, 4,283 miles our chart tells us. The company are profusely liberal in their supply of charts, guide-books, and time-tables. We calculate on doing this little distance in ten days and a bit, and shall not be disappointed. But we are on a silent deserted ocean. Not a sail is sighted. No icebergs will trouble us. We may fly along "full speed," without fear of collision, and for any excitement must find refuge in the ordinary means of enjoyment in mail steamers the world over—cards, games on deck, music in the saloon, flirtations. So we speed on, until, for some of us, all too soon, the gray, shadowy form of Fusiyama's peak becomes visible in the western sky, and our voyage through the unknown, or, we must now say, the little known, is over, and we have reached Japan. This country has been described so many times over and over again in late years, that further reference is unnecessary. We are on a trip of circumnavigation. On to Shanghai! Only a passage of three days and the low, muddy-coloured line on the horizon gives us our first glimpse of China. Soon the trees appear, then the masts of the vessels—an odd junk or two drift by us with their brown lateen sails and the Great Eye on the bows—we have reached the land of Cathay, having crossed two oceans and a great continent, and yet only four and a-half weeks ago we were in Liverpool!

We are now in well-known waters, and description is unnecessary. On the morrow we are again under way, and in four days reach Hong Kong, and here we take leave of the Canadian Pacific, which has rushed us along at such speed from Montreal.

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We now tranship to the Peninsular and Oriental, and, if we have hit the time exactly, are, in another five days, at Singapore. On to Penang and Colombo, still on to Aden, up the Red Sea, through the Canal, the Mediterranean, the Bay of Biscay, and once more set foot in England.

How long have we been? What distance have we travelled? We give the Canadian Pacific's figures, noting that the railway journey is in statute miles, the sea routes in nautical miles:—

Liverpool to Montreal	2,799	
Montreal to Vancouver	2,906	(land miles).
Vancouver to Yokohama	4,283	
Yokohama to Shanghai	1,047	
Shanghai to Hong Kong	810	
Hong Kong to Colombo	3,096	
Colombo to Port Said	3,488	
Port Said to London	3,215	

If we bring the land route to sea miles (say 2,535) we have a total of 21,273 miles.

The time taken is as follows:—

Liverpool to Montreal	7½ days,	by Allan Line.
Montreal to Vancouver	5½ ,,	by Canadian Pacific.
Vancouver to Hong Kong... ...	22 ,,	
Hong Kong to Colombo	13 ,,	by P. and O.
Colombo to London, *viâ* Gibraltar	25 ,,	,,
	73 days.	

If we chose to do the trip in the fastest time possible we could go by New York, reaching Montreal in one day less time, and from Colombo, *viâ* Brindisi, in seventeen days, thus making the round journey in sixty-four days. We have not, of course, circled the earth at the greatest diameter, but have gone an equivalent distance (within 300 miles), and have seen all the four great continents and crossed four different seas.

This is truly a great achievement; and, when we think of it, what a dominant race is the Anglo-Saxon in the peaceful doings of the world! Our great mail steamers sail on every principal track round the world: to India, to China,

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Australia, New Zealand, South Africa, all the chief American ports, north and south; everywhere great floating palaces of high speed are flying our flag. The more we humans know of each other, the more our interests are combined, surely the less chance of war and its horrors; the more chance of peace with its victories. Britain up to the present can certainly be said to rule the waves. Let us hope the rule will continue peaceful, and that, as years pass, our interests may become so inextricably mixed with other countries that war will become a virtual impossibility.

THE MERCANTILE SHIPBUILDING OF THE WORLD.

THE statistics relating to shipbuilding which are so carefully compiled by the Committee of Lloyd's Register of British and Foreign Shipping deal only with sailing-vessels of more than 100 tons net register and steam-vessels of more than 100 tons gross register, and although they have only been published for seven years, even in that brief period it is evident that the shipbuilding industry is extremely liable to fluctuations. The outputs of the shipbuilders of the world during that period was as follows:—

1885	there	were	692	vessels	of	624,658	tons	built.
1886	,,	,,	584	,,	,,	563,082	,,	,,
1887	,,	,,	539	,,	,,	579,779	,,	,,
1888	,,	,,	765	,,	,,	926,523	,,	,,
1889	,,	,,	1,090	,,	,,	1,502,629	,,	,,
1890	,,	,,	1,362	,,	,,	1,646,809	,,	,,
1891	,,	,,	1,420	,,	,,	1,532,827	,,	,,

It will be noted that although during the last year there was a decrease in the tonnage output of 113,982 tons there were 58 additional vessels constructed, the tendency to build on the average smaller vessels continuing. In the year 1889 the average vessel built was 1,378 tons, but in the year 1891 it dropped as low as 1,079 tons.

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TABLE I.

VESSELS BUILT DURING 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
United Kingdom	716	1,197,235	771	1,155,383
United States	175	148,878	169	100,062
Germany	68	102,465	83	76,431
British Colonies	108	44,540	99	38,350
Norway	56	27,153	68	35,329
Netherlands	24	26,133	19	27,537
Italy	44	19,642	42	26,409
France	32	34,562	18	16,719
Denmark	21	10,185	23	12,650
Sweden	33	12,692	28	12,180
Greece	32	8,704	39	10,562
Russia	17	5,052	29	8,408
Austria-Hungary	7	2,013	12	7,559
Other Countries	29	7,555	20	5,248
	1,362	1,646,809	1,420	1,532,827

The falling off in shipbuilding last year was not uniform, although 41,852 tons less shipping was built in the United Kingdom. Relatively, however, in the year 1891 the United Kingdom had even a better result than in the year 1890, when 72·7 per cent. of the entire output of the world was built by our shipbuilders at home, whereas in last year (1891) the corresponding percentage was 75·37. There is, however, room for improvement. Foreign competition does exist. On three occasions during the last seven years our shipbuilders were more successful. In the year 1887 the corresponding percentage was 82·29; in the year 1888 it was 83·86; and in the year 1889 it was 78·5.

While, however, our shipbuilders have foreign competitors they have also foreign customers, and during last year they built for shipowners in Norway 31 vessels of 45,600 tons, 22 vessels of 38,446 tons for owners registered in Germany, 34 vessels of 29,861 tons for Brazil, and 18 vessels of 23,852 tons for British Colonial owners. On the other hand, a Denmark firm of shipbuilders actually secured an order for a steel steamer of 1,440 tons for owners in the United Kingdom, and China, Japan, and Norway similarly each built a vessel for shipowners in our Colonies.

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The countries which had increased outputs in the year 1891 were as follows, the increases being shown in brackets:—Norway (8,176 tons), Italy (6,767 tons), Austria-Hungary (5,546 tons), Russia (3,556 tons), Denmark (2,465 tons), Greece (1,858 tons), and the Netherlands (1,404 tons).

The United States had a relatively serious falling off of 48,816 tons; Germany had a decrease of 26,034 tons; France had 17,843 tons lessened output; and the British Colonies and Sweden had also diminished activity.

TABLE II.

SAILING-VESSELS BUILT DURING 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
United Kingdom	84	121,015	142	214,352
United States	145	89,975	156	81,995
British Colonies	92	37,355	83	31,942
Germany	12	15,083	20	24,166
Italy	43	19,297	36	19,300
Norway	20	9,983	36	17,986
Netherlands	4	2,757	9	12,009
Greece	32	8,704	38	10,344
France	18	6,896	11	8,675
Russia	15	4,073	29	8,408
Denmark	9	1,500	13	3,900
Austria-Hungary	2	661	6	1,477
Sweden	—	—	5	1,126
Other Countries	6	969	7	1,697
	482	318,268	591	437,377

When comparing the statistics of the year 1888 with those of the year 1887* we reported a slight increase of 24 sailing-vessels of 15,760 tons. In the year 1889 there was evidently a revival in this department of shipbuilding, the increase for that year being 107 vessels of 103,959 tons. Again, in the year 1890, the year's output was further increased by 76,441 tons, and in the year 1891 the output reached 437,377 tons, an increase of 119,101 tons for one year, or as compared with the year 1887, when 193 sailing-vessels of 122,108 tons were built, the increase is nearly four-fold. We believe it has already been found that, as in steam-shipping, so also with

* *Nautical Magazine*, Vol. LVIII., page 684.

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sailing-vessels the supply of tonnage has overcome the demand, and in the early future lessened activity in shipbuilding in all branches may reasonably be anticipated.

The United Kingdom absorbed nearly nine-tenths of the increase in the building of sailing-vessels during last year, Germany, Norway, Netherlands, Russia, France, Greece, Denmark, Sweden, and Austria-Hungary having also a share; the United States and the British Colonies being the only enumerated countries which show a decline.

There are considerable fluctuations in the average tonnage of sailing-vessels, as will be seen by the following figures, and evidently the limits of size would appear to have been reached:—

	Average Size in the World.	Average Size of Sailing-Vessels Built in the United Kingdom.
1885	814 tons ...	... 1,307 tons
1886	764 ,, ...	... 1,378 ,,
1887	632 ,, ...	... 1,163 ,,
1888	635 ,, ...	... 1,248 ,,
1889	746 ,, ...	... 1,611 ,,
1890	660 ,, ...	... 1,440 ,,
1891	740 ,, ...	... 1,509 ,,

TABLE III.

STEAM-VESSELS BUILT DURING 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
United Kingdom ...	632	1,076,220	629	941,031
Germany	56	87,382	63	52,265
United States ...	30	58,903	13	18,067
Norway	36	17,170	32	17,343
Netherlands ...	20	23,376	10	15,528
Sweden	33	12,692	23	11,054
Denmark	12	8,685	10	8,750
France	14	27,666	7	8,044
Italy	1	345	6	7,109
British Colonies ...	16	7,185	16	6,408
Austria-Hungary ...	5	1,352	6	6,082
Greece	—	—	1	218
Russia	2	979	—	—
Other Countries ...	23	6,586	13	3,551
	880	1,328,541	829	1,095,450

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It is probable that for some years to come the year 1890 will stand out as the "red letter" one for the output of steam tonnage. In that year 880 steam-vessels, of 1,328,541 tons, were built, or 114 vessels and 67,739 tons in excess of the previous year. Last year showed a falling off of 51 vessels and 233,091 tons, and it is probable there will be a further decrease this year. During the last few years our shipbuilders have constructed more than four-fifths of the steam tonnage built in the world, but there are fluctuations in this respect, which point to the constant necessity of the shipbuilders of the United Kingdom being alert to meet the competition of their rivals abroad. In the year 1885 only 78·9 per cent. of the steam tonnage was built in the United Kingdom; in the following year the proportion fell to 76·6 per cent., rising with a jump to 88·73 per cent. in the year 1887, at which it remained practically stationary for two years, falling, however, in the year 1889 to 84·15 per cent., and again in the year 1890 to 81·07 per cent., but showing a recovery to 85·9 per cent. during last year.

A year ago there appeared to be reason to anticipate that iron and steel shipbuilding was becoming a substantial industry in the United States; but whereas in the year 1890, 11 iron steamers, of 18,147 tons were built in the States, in the year 1891 only 2 iron steamers of 930 tons were constructed. In steel shipbuilding there was likewise a falling off—from 12 steamers of 33,398 tons to 7 steamers of 12,541 tons. Notwithstanding their system of protection, the output of steam tonnage in the United States was less than one-third of that of the previous year, a remark equally true of France. None of the other countries have proportionately such heavy decreases, although Germany and the Netherlands have considerable diminutions.

The tendency to build mostly larger steamers appears to have been checked, as will be seen from the following average tonnages of steamers built during the last five years.

	Whole World Average Steamer.	United Kingdom Average Steamer.
1887	1,322 tons ...	... 1,515 tons
1888	1,439 ,, ...	... 1,657 ,,
1889	1,645 ,, ...	... 1,823 ,,
1890	1,509 ,, ...	... 1,702 ,,
1891	1,321 ,, ...	... 1,496 ,,

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TABLE IV.

THE MATERIALS OF WHICH SAILING AND STEAM-VESSELS WERE BUILT IN 1890 AND 1891.

	1890.		1891.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Iron	145	83,451	206	48,982
Steel	780	1,375,183	774	1,305,185
Wood	423	184,640	434	176,490
Composite	14	3,535	6	2,170
	1,362	1,646,809	1,420	1,532,827

Two years ago we ventured to hint the extreme proportionate limit of the use of steel in shipbuilding had been reached, and the statistics of the last two years bear out our supposition. In 1885 only 30·3 per cent. of the tonnage built in that year was constructed of steel; in 1886 the proportion rose to 45·4 per cent.; in 1887 to 72·2 per cent.; in 1888 to 84·2 per cent.; and in 1889 to 85·4 per cent. In the year 1890 the proportion fell to 83·5 per cent., but rallied again last year to 85·14 per cent. We need scarcely remind our readers that mild steel is a material requiring greater attention than the ordinary shipbuilding quality of iron.

TABLE V.

THE MATERIALS OF WHICH SAILING-VESSELS AND STEAM-VESSELS RESPECTIVELY WERE BUILT IN THE YEAR 1891.

	SAILING-VESSELS.		STEAM-VESSELS.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
Iron	10	4,586	196	44,396
Steel	184	271,494	590	1,033,691
Wood	396	160,389	38	16,101
Composite	1	908	5	1,262
	591	437,377	829	1,095,450

It will be seen that over one-third of the sailing-vessels constructed last year were timber-built. The revival in the use of wood, which has steadily progressed since the year 1887, however, shows a slight falling off, although every enumerated country except the Netherlands contributed its

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quota in the year 1891. In Russia, no other material was used, that country taking the place of Greece, which stood alone in the year 1890 as being the only enumerated country in which no iron or steel vessel was built, a steel steamer of 218 tons having been constructed in Greece during last year.

THE MERCHANT SHIPPING ACT OF 1892.

THE short Act which we print *in extenso* deals, as will be seen, with two distinct subjects. The first two clauses supplement the load-line legislation of the last few years, and the third to the fifth prescribe the inspection of ship's provisions.

The first clause appears at first sight to be unnecessary after what has already been done in previous Acts, but on examination it will be seen to supply a practical defect in existing legislation.

Legislation about the load-line goes back to the Act of 1876. The sixth clause of that Act gives to the Board of Trade, or to its specially appointed officers, the power to detain any vessel for survey which they have reason to believe is unseaworthy owing to defects in the ship, or owing to overloading or improper loading. The detention is at first provisional, then a survey is held at which the owner may be represented, and, finally, if the survey confirm the preliminary action of the Board, the vessel is detained until the defect is remedied, or the vessel is brought to a proper condition of loading. The practical operation of the Act of 1876 as against overloading was dependent upon this clause, until the enactment of the Load-Line Act of 1890.

By the twenty-fifth clause of the Act of 1876 the marking of British ships was prescribed. Every British ship, except ships under eighty tons register employed solely in the coasting trade, ships employed solely in fishing, and pleasure yachts, has to be marked by a disc, the centre of which indicates her maximum immersion in salt water. The disc was previously to 1890 placed on the ship by the owner at any position he thought proper, but once on and an agreement signed with the crew it could not be altered. It was in fact intended to represent an agreement between the owner and the crew that the vessel would not be loaded below a certain point. To

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secure this agreement being carried out, it was prescribed by the twenty-eighth clause of the Act that any owner or master allowing the ship to be so loaded as to submerge the centre of the disc in salt water should for each offence incur a penalty not exceeding one hundred pounds.

The Load-Line Act of 1890 was, in fact, an amending Act upon the Act of 1876. Instead of the owner himself fixing the position of the load-line disc, it was to be done by some authority appointed by the Board of Trade, and in accordance with the Tables of the Load-Line Committee of 1885. In all other respects the Act of 1876 remained intact. It thus resulted that a ship, being marked with a disc by some authority appointed by the Board of Trade, if loaded so that the disc was submerged, could not be detained unless the local officer of the Board of Trade was prepared to prove that she was overladen, and in this proof the position of the disc was not available as evidence. As a consequence of this it has been the practice when vessels were overladen to allow them to proceed to sea, but to take the next available opportunity of prosecuting the master. Such prosecutions have frequently ended in the infliction of a fine of £5 or £10 in cases where the freight on the extra cargo carried through overloading exceeded the amount of the fine. In some cases, however, the magistrate has imposed the full penalty; but it has been said that the amount of the penalty inflicted depended quite as much upon the opinions of the special magistrate upon the general question of overloading as upon the circumstances of the particular case. Further, the penalty is practically operative only against the master. To remedy this state of things it is now enacted that if the centre of the disc is submerged the vessel may be detained as unsafe under the Act of 1876.

Thus, in future, British vessels leaving British ports will be liable to detention if their load-line disc is submerged. For submerging the disc the penalty of £100 will still apply, and this will doubtless act as it has hitherto done as a deterrent to overloading in foreign ports. While on this subject, it may be desirable to refer to a paragraph in the current number of the Board of Trade *Journal* with reference to the freeboard of foreign ships trading to the United Kingdom. For some time past, the officers of the Board of Trade have detained foreign ships for overloading, and this has led, in a number of cases, to the assignment of freeboard to foreign ships by the authorities

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under the Load-Line Act. On application by the owners, the ship is surveyed and a freeboard is assigned. In some cases this is marked on the ship, as in the case of British ships, in others it is not marked, but a certificate stating the required freeboard is given to the master of the ship. The Board of Trade *Journal* informs us that up to August, 1892, freeboard has been assigned to 235 ships of various foreign nationalities, of which the largest number, 63, are German, while 42 are Swedish and Norwegian and 26 Danish. These were assigned by the various authorities under the Act as follows:— 29 by the Board of Trade, 107 by Lloyd's Register, 67 by Bureau Veritas, and 2 by the British Corporation for the Survey and Registry of Shipping.

The second part of the new Act, clauses three to five, deals with the question of the inspection of provisions. It will be seen that it refers to ships sailing on long voyages, that is, through the Suez Canal or beyond the Cape of Good Hope or Cape Horn. The inspection is to be made when practicable before the provisions are shipped, but may be made on board, in which latter case the water is also to be inspected. Shipowners who have been so heavily taxed with fees of late years will find some alleviation in the case of this new and somewhat harassing inspection in the fact that they will not have to pay fees for it.

We give the Act *in extenso* as follows:—

"CHAPTER 37.

"An Act to amend the Merchant Shipping Acts. [27th June, 1892.]

"Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

"1.—Every ship so loaded as to submerge in salt water the centre of the disc placed thereon in pursuance of the Merchant Shipping Acts, 1876 to 1890, and the regulations made thereunder, shall be deemed to be 'unsafe' within the meaning of the Merchant Shipping Act, 1876, and such submersion shall be reasonable and probable cause for the detention of the ship.

"2.—If any person makes default in complying with any regulation made by the Board of Trade in pursuance of the Merchant Shipping Act, 1890, with respect to the entry, publication, or delivery of copies of certificates or other particulars as to the draught of water and freeboard

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of a ship, he shall, for each such default, incur a penalty not exceeding one hundred pounds.

"8.—(1.) In the case of ships trading or going from any port of the United Kingdom through the Suez Canal, or round the Cape of Good Hope or Cape Horn, the prescribed officer shall in the prescribed manner, and before shipment whenever practicable, inspect the barrels of beef and pork, preserved meat and vegetables in tins, and the casks of flour or biscuits intended for the use of the crews of such ships, and shall in the prescribed manner, if satisfied that they are fit for such use, certify the same accordingly. (2.) The prescribed officer may at any time proceed on board a ship to ascertain whether the stores and water provided have been duly inspected, or, if not, whether they are of a quality fit for the use of the crew of such ship. If he finds the same not to have been inspected, and deficient in quality, he shall detain the ship until such defects are remedied to his satisfaction. (3.) No fee for such inspection shall be levied on the ship.

"4.—The Board of Trade may appoint officers for the purposes of any inspection required under this Act, and may, with the concurrence of the Treasury, assign them remuneration to be paid out of moneys provided by Parliament.

"5.—All rules made under this Act shall be laid before Parliament within three weeks after they are made, if Parliament be then sitting, and if Parliament be not then sitting, within three weeks after the beginning of the then next meeting of Parliament, and shall not come into operation until they have lain for forty days before both Houses of Parliament during the Session of Parliament.

"6.—(1.) This Act may be cited as the Merchant Shipping Act, 1892, and shall be construed as one with the Merchant Shipping Act, 1854, and the Acts amending the same. (2.) The Board of Trade may make rules for the purposes of this Act, and the expression 'prescribed' means prescribed by rules so made."

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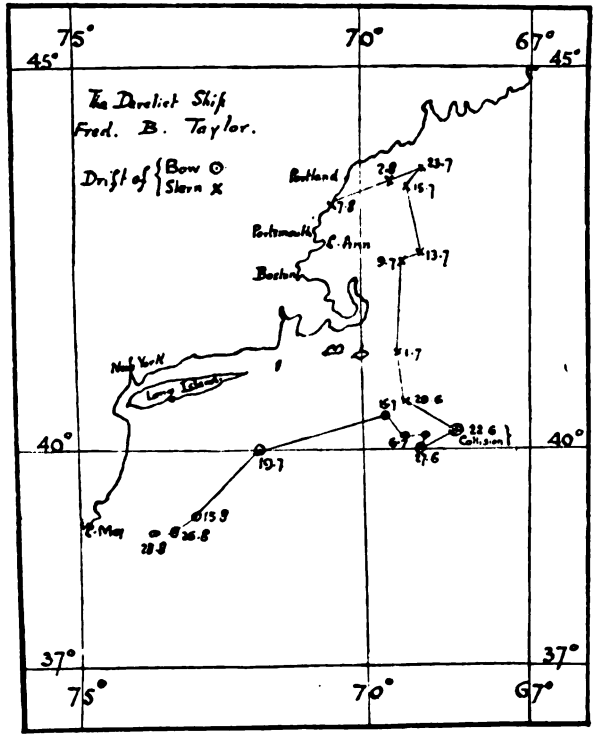
A UNIQUE WRECK DRIFT.

SEPTEMBER North Atlantic Pilot Chart is most interesting to navigators. Ancient history has its use; but the seafarer requires the latest information of wind and current, ice and fog, derelict ships and submerged dangers, as shown on the United States Pilot Chart every month. Not the least praiseworthy portion of the September issue is that devoted to the drifts of the two parts of the *Fred B. Taylor*. We give below a rough reduction thereof for the benefit of those not in possession of the chart itself. The *Fred B. Taylor* was a British wooden built ship, of 1,797 tons register, bound for New York in ballast. On 22nd June last, during a thick fog, she was cut completely in two by the eastern-bound German steamship *Trave*, and the drift of her two parts is deemed unique in the history of shipwrecks.



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CORRESPONDENCE.

WATERTIGHT BULKHEADS.

To the Editor of the "Nautical Magazine."

SIR,—The recent publication of the transactions of the Institution of Naval Architects, 1892, affords a suitable opportunity for directing public attention to a faulty method of placing and using watertight doors in divisional watertight bulkheads, which obtains in steamers of all classes, especially in "tramps."

On the 6th April last, B. Martell, Esq., Chief Surveyor to Lloyd's Register of Shipping, and Vice-President of the Institution, read an important paper on Divisional Watertight Bulkheads as applied to steamers and sailing-vessels.

The strength, position and efficiency of the bulkheads, and their value in helping to insure the safety of vessels, also the report and recommendations of the Bulkhead Committee, were the subjects treated of.

Although unmentioned in the paper and subsequent discussion, full-size drawings of four types of watertight doors hung on the walls of the theatre.

Prevented by circumstances from taking part in the debate at the time, I beg the favour of insertion in your next issue of the following observations:—

Steamers built on the plan objected to have their *main bulkhead* at the fore-end of the forward stokehold; it is the after-bulkhead of the "cross" or "reserve" bunker which is the part of the mainhold, and separated from the fore part by a light bulkhead, usually constructed of wood.

This reserve bunker is used for coal or cargo—coal being carried there on outward, and cargo on homeward, passages.

To enable the trimmers to get at the coal when required at sea, one and sometimes two watertight doors are fitted in the *main bulkhead* on a level with the stokehold platform, and these are *kept open* while coal is being drawn from the reserve bunker for the fires.

Practically speaking the *main bulkhead* does *not exist* during the time these *doors* are *open;* for, in the event of collision below the water-line and water rushing into either of the holds adjacent, the chance would be innumerable against the practicability of closing the doors, as rust, coal dust, and the

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natural slope of coal from the reserve would render doing so very difficult, if not impossible.

It seems strange that so much stress is laid on attempts to increase the number of bulkheads for safety of vessels whilst the practice here described is so general.

Apparently the importance of this feature in the design and working of ships has been overlooked by shipbuilders and owners, as well as by the Bulkhead Committee. I would only say there is no serious difficulty in the way of avoiding such bad structural arrangements.

I am, Sir, yours faithfully,

ALBERT G. FROUD, A.I.N.A.

Shipmasters' Society, 60, Fenchurch Street,
London, E.C., 31st August, 1892.

NIGHT SIGNALLING.

To the Editor of the "Nautical Magazine."

SIR,—Chancing to come across the May number of your interesting Magazine, I was greatly interested to read Mr. Irwin Hayward's letter and scheme for night signalling; and, as you invited criticism in a foot-note, I have taken the liberty of making a few observations.

There does not seem the least doubt that a means of communication at night between ships of the Mercantile Marine would occasionally be of the greatest use, and the only reason which appears to me to stand in the way of a method of night signalling being adopted is, that not sufficient importance is attached to it.

Assuming, however, that such a means of signalling is required, I cannot understand why some system is not adopted, because a system can be so easily arranged to signal the code messages of the International Signal Book, that no objection could be advanced on the score that it would be difficult to make it out. The questions then left are, what particular system should be adopted, and what particular appliance for signalling should be used.

Without discussing its many advantages, I do not think there can be the least doubt that some system constituted of those two simple elements, the "dot," and the "dash," would be the most suitable. The next question is, what special code of "dots" and "dashes" should be used. Mr. Irwin Hayward submits one of his own composition, where the shortest letter consists of two elements (— .) and would take 14 seconds

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to make, while the longest letter consists of six elements (— — — . . .) and would take 48 seconds to make.

Now, although I am unable to detect the particular idea which pervades the composition of his letter signs, I have no doubt he may have very good reasons for constructing them as he does, otherwise, I cannot make out why he has not adopted Morse's code. In that code, which is nearly internationally used in telegraphy and most of the foreign navies (and our own), no letter is symbolised by more than four elements, and the signs are so constructed that the shortest represent those letters which recur the most frequently.

Thus, taking the equivalent Morse signs to his letters and comparing the two codes, I find that his code is about 25 per cent. longer.

Judging from his code and his examples, I presume his system is only intended for use with the International Code Signal Book, but if the Morse code were wholly adopted (including the vowels) the value of such a system would be greatly enhanced by the fact that spelt messages could be signalled as well as coded messages. Mr. Irwin Hayward evidently objects to mixing his "dots" and "dashes" sandwich fashion, but my experience teaches me that it is as easy to read, say the letter X (— . . —, Morse code), as Z (— — . ., Morse code).

To my mind, the most difficult question is, what kind of signalling apparatus should be used. Morse can be made in so many different manners at night, that it is hard to say which would answer most.

To ships lighted by the incandescent electric lamps, I am inclined to think that the simplest method to use would be to have four pairs of lamps fixed along one of the topmast backstays about five feet apart. Each pair of lamps to consist of one white and one red lamp. The white light to represent a "dot" and the red light the "dash." By an easily constructed and simple switchboard on deck, the letters could be made by a man of the meanest capacity.

Example:—

Letter Y (Morse code) — . — —.

Method of making it:—

Switch the upper lamp to *red*, the next one to *white*, and the two lower lamps to *red*.

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The advantage of such a method is obvious. The elements composing the letter are all visible at the same time, and can be kept so until seen and answered. A very possible objection to it is, that the electric lamps, circuit, &c., are liable to get out of order owing to exposure to the weather. From experience in the Navy, however, this can be generally guarded against successfully by exercising a little supervision.

Another apparatus is an oil lamp fitted with a movable obscuring shade for making short and long exposures of light.

The greatest objection to this apparatus for flashing, which I can think of, is that it requires a certain amount of practice to use. This, I opine, would be a great disadvantage in a vessel belonging to the Mercantile Marine. However, in well-manned steamers, an officer or man with a very little training could be taught both to send and read at a rate which would be quite fast enough to enable him to get in a short coded message to a passing steamer.

There are other methods of flashing, but as they either involve trained signalmen or expensive apparati, I consider them unadapted for the Mercantile Marine.

The general rules for any kind of flashing are: taking the dot or short flash as the unit of time, the dash or long flash should be equal to three units. The space between the elements of a letter should be equal to one unit; between letters, three units; and between words, six units. Accuracy in signalling by Morse's code depends entirely on the strictness in which the rules are adhered to.

I have necessarily been obliged to leave out many details and arguments in favour of what I have briefly outlined, and I am fully conscious of the incompleteness of what I advocate. As it is, my letter has far exceeded the length I intended it to be, and, although I have attempted to be brief, I have found it impossible to discuss such a subject thoroughly in a letter which I have meant to be concise. Apologising for taking up so much of your valuable space,

I am, yours sincerely,

H.M.S. *Amphion*. ALLAN F. EVERETT, Lieut. R.N.

NIGHT SIGNALLING.

To the Editor of the "Nautical Magazine."

SIR,—I think that Mr. Hayward's code of night signals given in your May number would scarcely be feasible with a white light, but would act better with a lamp having a blue shade or

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glass, because there are always a number of white lights seen from a passing steamer, and it would sometimes be difficult to tell which was the signalling light.

Also the burning of a blue light (at least within pilotage limits) would render a ship liable to penalty, instead of a blue light, two long and two short blasts on steam whistle or other combination, would probably answer the purpose of drawing attention.

Yours obediently,

Swansea, September 3rd, 1892. GEORDIE.

TRANSPORT OF PETROLEUM THROUGH SUEZ CANAL.

To the Editor of the "Nautical Magazine."

SIR,—While not objecting in the least to the "analogy between cotton, dynamite or gunpowder, and petroleum," suggested in the reply of G. H. Little in your September number to my letter of previous month, you will perhaps allow me to repeat that my point was to consider these products—"as packed for sea carriage" and compare them with *bulk* petroleum in tankers. Granted that all are inflammable or explosive, but there the analogy must cease, because the "practical man"—that is to say, the man who has carried or surveyed these goods—knows that with the first three, *fire* on board may be controlled by water, but with bulk petroleum it cannot, and the danger in fact is increased by any attempt to scuttle the vessel.

Then concerning the question by G. H. Little, viz., "Why will people continually hurl the *Wildflower* case at one?"—he should remember that my previous letter merely quoted word for word his own reference to this case. Certainly the present writer knew that the cargo was crude oil, having seen some of it produced and ignited in court, as evidence. Again my letter said nothing against the efficacy of sand in quenching fire,—my point being that the sides of the Suez Canal are protected by stone and gabions, and dry sand does not exist near the water line.

Finally if G. H. Little will reflect that intelligent British shipowners look for profit from the homeward rather than the outward voyage, and know that most East India produce will be damaged by stowage in oil tanks, he will probably see that their dislike to a full cargo of rattans, or cocoa-nuts in husks, at dunnage rates is, rather than lack of enterprise, the real cause why they are content to see the foreigner exploit this trade, and gain experience in the usual way.

Yours faithfully,

London, E.C., 6th September, 1892. G. A. LAWS.

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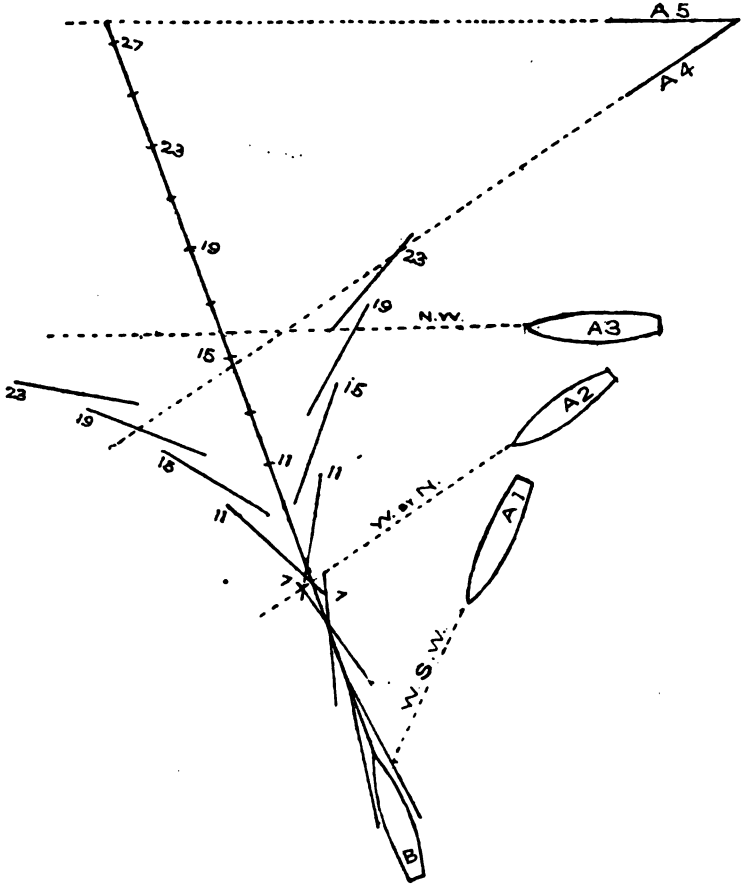
SHIPS' LIGHTS.

To the Editor of the "Nautical Magazine."

SIR,—In your September number, Admiral P. H. Colomb submits illustrations to scale, showing those positions a vessel would occupy in relation to other vessels at a four-point bearing when first sighting lights from 350 yards to 600 yards distant.

The various positions attained in seconds of time by a 300 ft. vessel *keeping her speed* will clearly show what the result might be. It is impossible to say what individual judgment may be tempted to do, as the author plainly sets forth in the diagrams he has submitted to scale, and which I herewith re-produce.



A fact, however, will always remain to be observed, that with individuals rests the possibility of lessening the numbers

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of collisions annually. While on maritime nations falls the responsibility of diminishing, to some extent, *risks*, covered by appearances, that do not fail to present themselves in practical navigation.

Those diagrams I submitted in your July issue were to show the possibility of placing "Regulation Lights," so that risks as they exist can be observed at once, assuming we work to no scale other than that measured by lights penetrating from the distance; they are supposed to be visible two to three, and even five, miles. Article 2.

We find no rule exists that compels a giving-way vessel to keep her speed, and no rule should exist compelling any vessel to keep her speed.

Lights should inform the navigator when various degrees of risk present themselves, and to this end the diagrams A 1, A 2, and A 3, in relative position with vessel B, show those positions can only be changed by the colour or bearing of lights.

If we raise the question resting with the probability or improbability of what individual action will be, especially when lights sighted are placed to cover an "arc" of ten points, we may find ourselves occupying the position similar to watching a "game of chess," over which we have no control in making a move.

Admiral Colomb remarks that Mr. John Glover has shown collision is the one kind of wreck which we have as yet made no progress in checking. This is to be regretted, as the subject has provoked much discussion during the past thirty-five years under circumstances where lights and fog-signals have remained pretty much the same as they stand at present, leaving individual judgment to determine the extent of risk a vessel becomes subject to with respect to the bearing and course steered by another.

When lights can be sighted in the distance there exists a lack of confidence that causes one to "starboard" while another is using "port helm." To an extent it is possible to provide against such action being taken, since nothing that is misleading appears to be the attractive feature in the danger signal for steam-vessels if carried as proposed by Sir Digby Murray, Bart., of the "Board of Trade."

There seems to be a consensus of opinion in favour of that bright light carried at least 15 ft. below the masthead-light, and sufficiently far enough for'ard, in range with the vessel's keel, to make its appearance distinct from that of a vessel

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towing another, and possessing the double advantage of explaining in which direction a vessel is moving from the original bearing of the light when first sighted, or when in range with the masthead-light it warns the observer that imminent risk obtains.

It possesses the advantages of being sighted much further than coloured lights, and directs attention *instantly* to any alteration in the course steered by the vessel carrying it.

Its non-appearance warns the giving-way vessel collision is impossible if the latter checks her speed *in time*. It is, and always has been, considered important to know when the giving-way vessel (Article 16) may secure her safety by stopping if necessary. Lights at present show no such indication of timely warning!

I fail to see the advantage of a "scale" worked out where vessel B creates a collision with diagrams A 2 and A 3, when it is a moral certainty if B checks her speed, or, if necessary, stops altogether to the masthead-light of A 2 or the red light of A 3, a collision could not take place where the "right of way" vessel keeps her course. The *bearing* of lights makes no difference so long as the danger signal is not visible.

It may be as well to remark that in dealing with lights we do not anticipate cases where "Sound Signals" are required and lights are practically valueless.

A "danger signal" sighted by a giving-way vessel, and in range with a masthead-light, would direct the movements of the former vessel according to the bearing of the vessel showing those lights, hence we may see the fallacy of a right of way vessel compelled to keep her *course* and *speed* in all cases, as proposed by the Washington International Maritime Conference. The proposal to do so has justly been qualified by a few words ably provided by a Committee appointed by the Board of Trade. They say in language unmistakable to the navigator, *Article* 21:—

Where by any of these rules one of two vessels is to keep out of the way, the other shall keep her course and speed. "*Unless in consequence of thick weather or other causes she finds herself so close that collision cannot be avoided by the action of the giving-way vessel alone, when she shall take such action as will best aid to avert collision.*"

This comprehensible rule, working in harmony with lights that present the extreme inside limit of the danger-angle, tends to make all amenable to avoid a collision without

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interfering with the "Rules of the Road" as they exist. It is important to some positions a "right of way" vessel occupies, that, the masthead-light on all steam-vessels should cover 135° only, instead of 225° as at present, it would then cover the principal "danger arc," leaving the coloured lights to appear simultaneously with the disappearance of the masthead-light.

In general, Admiral Colomb appears to deal with the relative speeds of vessels, and their turning powers, when those vessels are practically within hailing distance, and suggests that I advocate the use of additional Anti-Collision Lights for very thick weather, consequently his remarks do not apply to the subject of my July correspondence.

I am, Sir,

Your very obedient servant,

NAVIGATOR.

BOOKS RECEIVED.

The Naval Architect's and Shipbuilder's Pocket Book. By Clement Mackrow. Fifth Edition. London: Crosby, Lockwood & Son. 1892.

THE rapid disposal of four editions of this book is a sufficient indication that its merits are appreciated. We can truly say that for reference purposes it is invaluable, and we are assured by naval architects that for their work it is a handy, most useful, and trustworthy publication. This new edition contains more matter than the previous issue, and the information throughout has been carefully revised. We congratulate author and publishers on the issue of this new, revised and improved edition.

Segelhandbuch für den Indischen Ozean: mit einem Atlas von 35 *Karten.* Hamburg: L. Friederichsen & Co. 1892.

THIS work—a sailing directory for the Indian Ocean, with numerous charts and plates, illustrative of the letterpress—is the latest issue of the German "Seewarte," under the direction of Dr. Neumayer, whose name alone is a sufficient guarantee for the scientific value and practical utility of the range of subjects discussed.

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A few brief remarks on the area, physical geography, and meteorology of the Indian Ocean are followed by concise descriptions of the oceanic depths, the temperature and specific gravity of the water, concluding with the distribution of the oceanic currents, and their change in range and direction with the varying seasons.

In the Indian Ocean, which, while widely open only to southward, is surrounded by land in every other direction, with its northern part entirely confined within the tropics, the atmospheric conditions are essentially different from those of the Atlantic and Pacific Oceans; the subject is ably treated in connection with the wind and weather, the air temperature and pressure, and the distribution of rain, first, over the open ocean, and then within the area of the coastal districts; the storms and hurricanes being discussed in relation to their special characteristics within the northern tropic, the southern tropic, and in the extra-tropical region to the southward. These subjects occupy several chapters, and others follow on the tides and height of waves, the chronometer, and the method of dealing with it in relation to rate as affected by temperature, &c. Next comes the important subject of magnetism, treated in relation to the declination (variation) and dip of the needle, with its horizontal and total intensity; and many valuable remarks on the compass and its deviation. Lastly, attention is called to the whale fishery of the Indian Ocean.

The first and scientific part of the work occupies 422 pages, the second part, of 384 pages, is devoted entirely to sailing directions, and the routes that should be adopted in the different seasons according to the prevalent winds: these routes appertain not only to the Indian Ocean, but include those of the eastern and western route to China.

The work is well up to date on every subject on which it treats; and it must be stated that in its compilation the editor had the assistance of the most able specialists.

The Methods and Results of the Survey of the West Coast of Lower California by the Officers of the U.S.S. "Ranger" during the Season of 1889 *and* 1890. Washington. 1892.

This report, No. 101 of the publications of the U.S. Hydrographic Office, was planned and mainly written by a gentleman with whose works we have come to be very familiar—Mr. G. W. Littlehales, C.E., Chief of the Division of Chart Construction. The object of the report is to recor

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the methods of conducting a survey for the production of nautical charts which have gradually been developed in the survey of the West Coast of Mexico under the direction of the U.S. Hydrographic Office, and, by placing the results of experience in the hands of future workers in the same field, to afford a surer means of securing further advance in this most important branch of nautical science.

The work describes every part of the progress of the survey from the time of the reconnaissance of the area to be surveyed to the completion of the operations of the survey; the instruments used and the method of using them, the measurement of the base line, the main triangulation, and the secondary or shore triangulation; the hydrography, the magnetic work, the tidal observations, and the determination of the geographical position of the principal point of observation.

Not only have we a description of the progressive work of the survey in the field of operation, but we have also the computations in connection with the triangulation, the computations for latitude, longitude, azimuths, &c., and for the various magnetic elements.

Finally the field work being completed and the computations finished the data are transmitted to the Hydrographic Office, and there the construction of the chart of the area surveyed is forthwith commenced; and here we are introduced to the method of chart construction on the basis of the data derived from the field work and the resulting computations, but the subject is not dismissed until the drawing has passed from the draughtsman to the engraver, and thence to the printer.

An excellent and well-planned work, which should be in the hands of every person engaged in and learning the principles and method of nautical surveying.

Transport, a new weekly publication relating to docks, harbours, canals and railways, seems likely to prove a useful organ for the interests to which it is devoted. The various numbers issued to date contains much useful and interesting news, well arranged, but the price of sixpence per week is not in its favour.

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THE ROYAL NAVAL RESERVE.

THE GAZETTES.

Admiralty, August 18th.

Sub-Lieutenant G. E. Bridge to be Lieutenant (to date August 12th, 1892).

Admiralty, August 18th.

Sub-Lieutenant G. R. Cox to be Lieutenant (to date August 16th, 1892).

Admiralty, September 8th.

The undermentioned gentlemen have been appointed officers, viz.:—Robert Greey, James George Henry Flint, to be Lieutenants; James Henry Coghlan Boig, Walter Johnson, John Sutherland Hutchinson, James Bowyer, William Morton, Thomas Sanderson Vernon, Lewis Austin Millard, James Egerton Crossland, Joseph King, Daniel Dow, Henry Arthur Eagleton, Wilfred Henry Dulcken, Benjamin Steel, William Browning Cresser, John George, Herbert Denyer, Joseph Barlow Ranson, Edward Reed, Donald John Munro, Alfred Edward Rimmer, Frederick William Haigh James, Grismond Phillips, Richard Sydney Sabine Pasley, Thomas Smith Price, Arthur Joseph Hocken, Edward Gates James, James Northcott Culverwell, Arthur Powett Dix, John Dugald Andrews, John Charles Jones, John Robert McEwan, Edward Paul McClean, Percy Gibson, Charles Henry Walter Willes, to be Sub-Lieutenants; Alexander MacGregor, John McIver, Robert Alexander Scott, Daniel McPhee, Emile Raimund Buck, Alexander Cameron Crichton, Paul MacDonald, William Henry Campbell, Charles Douglas Currie, William Stewart, John Osborne Morgan, William Donald Robertson, William Thompson Brown, to be Engineers; Robert Tucker, John William Flahavan, Ernest William Collings, Samuel Ernest Baber, to be Assistant Engineers; Emra Holmes, Howard Percy Devereux, to be Hon. Paymasters; Thomas Carr Stockdale to be Hon. Assistant Paymaster (all dated September 1st, 1892).

Admiralty, September 9th.

Sub-Lieutenant J. E. Pierce to be Lieutenant (to date September 7th, 1892).

APPOINTMENTS.

Lieutenants: F. H. Ekins to *Camperdown* (to date August 19th); H. M. Benison (acting) to *Australia* (to date September 1st); D. L. Neilson (acting) to *Immortalité* (to date October 9th); C. de H. Bell (acting) to *Anson* (to date October 24th); C. A. Robertson and D. Watson (acting) to *Excellent*, additional (to date September 10th);

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F. J. Davies to *Excellent*, additional (to date September 10th); R. R. Hubbard to *Excellent*, additional for short gunnery course (to date September 10th); D. D. Lane to *Immortalité* (to date October 9th); G. F. Simpson to *Excellent*, additional (to date September 17th). Sub-Lieutenants: E. C. Miller (acting) to *Royal Sovereign*, additional (to date October 26th); W. F. J. Faddy (acting) to *Excellent*, additional for short gunnery course (to date September 10th).

THE Rangoon Naval Volunteer Artillery are in future to be known as the "Rangoon Naval Volunteers."

THE Lords of the Admiralty have notified the Canadian Government that vessels registered in Canada are now authorised to use the red ensign bearing in its field the arms of the Dominion. Seeing that Canada stands fifth among the maritime powers of the world, this permission to fly the Canadian ensign is of general interest.

WE regret to see that Lieut. F. W. Vibert has been invalided home from Malta. He was serving on board the *Dreadnought* on the Mediterranean station, to which ship he was appointed for twelve months' training on the 24th November, 1891.

IT is with deep regret that we record the removal of another name from the list of honorary officers of the Royal Naval Reserve by the sudden death, at Dunrobin Castle, of the Duke of Sutherland. The Duke, who was in his sixty-fifth year, was devoted to yachting. He was very popular in the North of Scotland, and his lamented death removes one of the most public-spirited men in that country.

WE notice with pleasure (from a report in the *Shipping Gazette*) that Paymaster J. Swain, R.N.R., is doing good work for that splendid Society the Royal National Lifeboat Institute, he having collected the sum of £21 10s. (entirely from sailors, we suppose) at the Poplar Mercantile Marine office, of which he is Superintendent. We trust that the Superintendents of other Mercantile Marine offices are doing equally as well.

THE Marquis of Ormonde, whom Her Majesty has appointed Vice-Admiral of Leinster, is, as everyone knows, an enthusiastic yachtsman, and an honorary officer of the Royal Naval Reserve. The Marquis is Vice-Commodore of the Royal Yacht Squadron,

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of which the Prince of Wales is President, and has pushed his adventurous barque as far north as the rugged cliffs of Spitzbergen. He is a famous sportsman, with a record for elephant-killing in Africa and many a bag of big game in the Rockies. The Marchioness of Ormonde was Lady Elizabeth Harriet Grosvenor, eldest daughter of the Duke of Westminster, who named his grand horse—the sire of Orme—after his son-in-law. Her ladyship is a woman of great personal beauty; and the Marquis and Marchioness of Ormonde are often described as the handsomest couple in London.

THE *Admiralty and Horse Guards Gazette* consoles itself with the reflection "that it is better to have Lord George Hamilton in the cold shade of opposition on £2,000 a year than meddling and muddling at the Admiralty on rather more than double that amount." We agree with our contemporary, but we imagine that there are a great many people who would be better pleased to see him in the "cold shade of opposition" on £0,000 a year, and the "unearned increment" which he is now enjoying, devoted to providing a few more good service pensions for really deserving officers who have served their country faithfully in their day.

THE new Board of Admiralty consists of Earl Spencer (First Lord), Sir A. H. Hoskins, K.C.B. (First Naval Lord), Sir F. W. Richards, K.C.B. (Second Naval Lord), Lord W. T. Kerr (Junior Naval Lord), Rear-Admiral J. A. Fisher, C.B. (Controller), and Mr. E. Robertson, M.P. (Civil Lord). The Junior Naval Lord is a brother of the Marquis of Lothian, and is married to a sister of Earl Cowper. The Civil Lord represents Dundee in Parliament. The First Lord has appointed Captain R. H. Hamond, R.N., to be his private secretary, and Messrs. W. Graham Greene and J. A. Peil to be his assistant private secretaries. Mr. J. H. Brooks has been appointed private secretary to Lord Walter Kerr, and Mr. W. P. Fielding will act in the same capacity to the Civil Lord.

MR. GLADSTONE appears to have made some unfortunate blunders in the formation of his Government. Everybody taking the slightest interest in Naval affairs is puzzled to understand why Lord Brassey, whose special qualifications for the post of First Lord are beyond all question, should have

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been offered the Mastership of the Buckhounds! It is generally understood that his Lordship knows little and cares less about buckhounds, but he is at heart a true sailor, has made Naval affairs the study of his life, and would certainly have made his mark at Whitehall had he been given an opportunity. Another capable man, Sir Edward J. Reed, has been shut out from the Admiralty, a further blunder which gives point to his assertion that the special qualification for the Admiralty Board is absolute ignorance of everything appertaining to a ship. Had Lord Brassey's fancy been dogs instead of ships, he might now have been "Ruler of the Queen's Navee."

THE Royal United Service Institution is taking a very proper step in appealing to all who are interested in the efficiency of the Navy and Army to contribute to raising the £25,000 which will be required to re-house and re-equip the Institution, and we sincerely trust that the appeal will not be made in vain. Now is the time for Naval Reserve officers to come forward and help by becoming life members. They will find that the benefits of receiving the Journal of the Institution will alone exceed in value the subscription paid. The council are advertising for a Librarian and Editor of the Journal at a salary of £300. It will be good policy on the part of the council to appoint a naval officer to this post, as the Army is already well represented on the staff.

THE sea-board of India appears of late to have become the happy hunting ground of bogus blue jackets, but at last the genuine article is beginning to protest. "A Sailor," writing to the *Times of India*, says :—

"Taking into consideration the small number of practical seamen who are members of the corps, and the improbability that the other members would ever become sufficiently acquainted with the practical side of a Naval Volunteer's life when on board ship to efficiently perform seamen's duty, it is surprising that the Government of India have not before this followed the lead of the Admiralty, and dealt with the Naval Volunteer force in this country in the same manner as the latter has done with the Royal Naval Artillery Volunteers in England."

It is indeed surprising, but apparently the Government of India wants educating up to it as did our own Admiralty, and we advise "A Sailor," and others of his cloth, to lose neither time nor opportunity in enlightening them. There is quite

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enough of the bogus element in the Indian Marine without adding to it by so-called "Naval Volunteers."

THE *Army and Navy Gazette* has recently been compelled to go through the performance described by our American cousins as "stepping out and down" in connection with its unjustifiable attempt to connect Lieutenant Mossman, R.N.R., with the *Forth* disaster, for which it was promptly called to account. This is the way our contemporary attempts to wriggle out of it:—

"In commenting upon the *Forth* court-martial last week we were a little unfair to the Reserve officer who was on watch at the time of the misadventure. We said, 'What with a Royal Naval Reserve man on the bridge who had never stood a watch'—but we should have added, 'in a sea-going man-of-war.' As the sentence read it might have been imagined, and, indeed, we were under the impression, that this officer was a youngster with little or no experience, instead of which we have since learnt that he has been at sea for nineteen years on Australian or other long voyages, and a responsible officer of the watch in the Mercantile Marine for fifteen years with no mishap. Such a man only requires naval training on board a man-of-war to learn the routine of the Service, and this experience he was on board the *Forth* to gain. In a way his start has been unfortunate, but we hope Mr. Mossman will persevere for a twelvemonth, for with officers of the regular Service, as scarce as they are, every man of the Mercantile Marine who will properly qualify himself is performing a patriotic action, and should earn the gratitude of his countrymen."

Lord Rosebery at the recent meeting of the Institute of Journalists proposed as a motto for the Institute, "Be just and fear not," because it was by its justice and its fearlessness that the British Press had attained to a position which no other Press in the world had attained to. Our contemporary is hardly contributing to the stability of the position.

"PIGGING it out" ventilates a grievance in a service contemporary, which assuredly someone should be made responsible for. He complains of the playful habit of their Lordships in appointing him to a ship in which the new rules with regard to cabin furniture are not in force. He finds on arriving that his cabin is a howling wilderness, with neither bed, bath, nor basin, &c. If the paymaster is sufficiently amiable, he will probably lend the sufferer the necessary gear, which may by chance have been supplied for the use of a

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confrère in the R.N.R., who has not joined; but if the things are not obtainable from this source he will have to "pig it out" till he can purchase the things ashore. On the other hand, when an officer has invested in cabin furniture, and is suddenly appointed to a ship to which the fittings are supplied, he has to place them in store with a result at the end of a commission, which may be easily imagined. Our experience of Naval officers is that they either quietly endure unheard of grievances, or when they do protest it is done so mildly that no one thinks they are in earnest. This correspondent is no exception to the rule. He diffidently suggests a way out of the difficulty, that ought to have been apparent long ago to the greatest dunderhead at the Admiralty, and that is to give notice in an officer's appointment whether the cabin furniture is to be supplied or not. It seems incredible to us that there should be both "old rules" and "new rules" in existence at the same time to the possible inconvenience and annoyance of the whole service. If the War Office were so regardless of the comfort of soldiers, we should soon see a furious bombardment of the authorities through the Press, and this is the main reason why the Army is so immeasurably better off than the senior service in every respect. When they want a thing they are never happy until they get it, and they have the happy knack of letting the authorities know it with effect.

We have every reason to shake hands with ourselves on the publication of another half-yearly gazette of goodly proportions, which owes not a few of its numbers to the interest excited in the Naval Reserve by the increasing circulation of this journal amongst officers of the Mercantile Marine. Some of the additions to the engineers' list are suggestive of the Clyde and the B.I. Service, and we fancy we can trace in the recruits the work of one or two enthusiastic young officers of our acquaintance who are now serving out in the East. Commenting on the gazette the *Admiralty and Horse Guards Gazette* says:—

"We observe that the Admiralty have just appointed fifty-seven additional officers to the Naval Reserve, seventeen of whom are engineers or assistant engineers. We are glad to see by this that the present Board means to adhere to the policy of its predecessor in regard to recognising the value of the Naval Reserve. We trust, however, that it will not fall into the mistake of thinking that the existing deficiency in

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lieutenants and engineer officers can be made good by gazetting gentlemen to analogous ranks in the Reserve. That force is a supplement to, not a substitute for, the Navy proper."

Nobody, so far as we are aware, ever said it was anything else, and our contemporary need not be afraid that the officers of the Royal Naval Reserve will ever fall into the error of imagining (as some militia officers apparently do at the present moment with regard to the Army) that they are the same as the Royal Navy, only a little better. Such being the case we see no reason why the entire service press should not ungrudgingly lend us their powerful support and advocacy in obtaining justice for the Royal Naval Reserve and join hands in helping to make it what it unquestionably ought to be—the backbone of our first line of defence.

THE special correspondent of the *Daily Telegraph* serving on board the *Arethusa* during the recent manœuvres appears to have considered it part of his duty to give the officers of that ship a sort of certificate for good conduct and ability before leaving, to judge from the following production, in which it will be seen, our friend Lieut. Herbert Blake has a place:—

"The officers, who some five weeks ago were brought together from all quarters to do duty during the brief mobilisation, and who in a very brief period had "shaken down" into a happy family organisation, will be again dispersed over the face of earth and water. Captain William H. Henderson, the able and energetic director of our recent cruiser, who comes of an old Kentish family long connected with the British Navy, and who has three brothers in the Service, goes for a time on half-pay, as does also Commander John Casement, whose laborious duties have been discharged with a diligence I have been compelled to admire. The experienced and careful navigating officer, Staff-Commander Lilburn, returns to the Reserve Fleet; Lieutenant W. Oliver goes to the *Northampton;* Lieutenant Edwin Day has been appointed to the *Stork* for surveying purposes in the Red Sea; Lieutenant Frankis, of the Marines, resumes his ordinary duties with the Chatham garrison; the venerable Fleet-Paymaster, Mr. Frederick R. G. Wright, whose personal qualities would endear him to everybody quite apart from the agreeable official functions he has to discharge, is taking farewell of his present colleagues in order to assume duty on the *Colossus* in the Mediterranean; and our doctor, Fleet-Surgeon Frederick M'Clement, who, I am happy to say, has had so few patients in the sick bay, that he has had ample leisure to narrate the thrilling stories collected during a long and honourable career, is being sent to vegetate in a harbour-defence hulk at Aberdeen. Mr. Herbert Blake, whose name will be familiar to many Eastern travellers

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as that of one of the captains of the British India mail steamers, and who has been doing duty in this commission as a lieutenant of the Royal Naval Reserve will, after a rest, return to his permanent post."

Mr. "Special" is a little bit at sea with regard to the "harbour-defence hulk" at Aberdeen to which he has consigned the Doctor. He doubtless means the *Clyde*, drill-ship for the Royal Naval Reserve at that port.

TORPEDO, GUNNERY, &c., COURSES, 1892-93.

The following is to be substituted for the table issued in July, 1891:—

4. Lieutenants' short courses, viz., eight weeks each of gunnery and torpedo.

(*a.*) For officers volunteering from half-pay, or for officers Royal Naval Reserve or Indian Marine.

(*b.*) For officers Royal Navy or Royal Marines serving in ships at home ports who will be detailed by the Commander-in-Chief as they can be spared.

(*c.*) Officers, Royal Marines, serving at divisional headquarters, are to be detailed for these courses as they can be spared: the Colonels Commandant arranging accordingly with the Commander-in-Chief at Portsmouth.

Appointments to be dated as under. Officers to join not later than 8 p.m. on those dates.	*Excellent*, *Cambridge*, or *Vernon*. Commencing.	Ending.
Saturday, Sept. 10, 1892 (Gunnery)	... Sept. 12, 1892	... Nov. 4, 1892
,, Oct. 22, 1892 (Gunnery and Torpedo)	... Oct. 24, 1892	... Dec. 16, 1892
,, Dec. 31, 1892 Ditto	... Jan. 2, 1893	... Feb. 24, 1893
,, Feb. 25, 1893 Ditto	... Feb. 27, 1893	... April 28, 1893*
,, April 28, 1893 Ditto	... May 1, 1893	... June 23, 1893

NOTE.—Officers on applying to go through a course of instruction should state which gunnery ship they wish to join, and they will be appointed to the *Excellent* or *Cambridge* for the gunnery course, as may be decided to be most convenient; and to the *Vernon* for the torpedo course.

What we should like very much to know is, when their Lordships are going to invite the engineers R.N.R. to go through short courses of hydraulics and electricity. It is high time that something was done to convince these gentlemen that they are regarded at headquarters as something more than a "paper force."

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* Including five days' leave at Easter.

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NAVAL Reserve officers who have worked long and hard, and who have spent much money in promoting the interests of the Service, must have noted with disgust and heart-sickening the action of the late Ministry in conferring a C.B.-ship on Mr. Chas. Seth-Smith, late Lieutenant commanding the defunct "Bottle-washers." It is simply becoming a public scandal that the claims of a number of deserving officers who have distinguished themselves by long-continued devotion to the welfare of the Royal Naval Reserve should be so persistently ignored, whilst amateurs like Mr. Smith, who have done more harm to the country than good by their fussing, should be singled out for honours and rewards. We should like very much to know what their Lordships intend doing in the case of Lieut. Joseph Watson who has just retired after twenty-two years' service from the important post of Superintendent of the Mercantile Marine Office at Tower Hill, where he had most onerous duties to discharge in connection with the Reserve. Lieut. Watson has carried on the work of recruiting for the Reserve in that district with great energy and zeal, and the least that the Admiralty can do now on his retirement, is to grant him permission to assume the rank of Retired-Commander. Lieut. Watson, whose commission as lieutenant is dated the 29th May, 1862, when in active service was a well-known and experienced commander in Messrs. Green's employ.

ON the question of Indian Marine precedency, a Naval officer writing home from the East India station remarks that the Indian Marine seem to be unduly elated with their improved position, but on board his ship they have found it expedient to treat them with stolid indifference. He says the whole thing will not work long, but must be readjusted, as they are finding that it will clash more in India than on Whale Island, and clash with the R.N., too, who have more interests at home than the R.N.R. to rectify matters. This is satisfactory, and once let the R.N. make common cause with the R.N.R. in this matter, and the Indian Marine will be nowhere.

THE letter of "Retired Lieutenant, R.N.R," which we publish this month will have the effect, we hope, of stirring up his brother officers and infusing new life into the agitation for the removal of the indignity which has been cast on the Reserve. We are in hopes, however, that the new Board will at once see the unwisdom of their predecessors, and speedily

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undo the mischief that has been done; but as the Indian Marine and their friends will make a hard fight to maintain the exalted position into which they were so unexpectedly thrust, the Reserve must be prepared to carry out, if necessary, this agitation to the bitter end. We must be prepared to thresh out this question when the Vote for the Naval Reserve is taken, and towards that end no opportunity should be lost of enlightening members of Parliament as to the main points of our case. Should we not be able to carry our point on the Estimates, a petition to Parliament must be resorted to *signed by every officer of the Royal Naval Reserve*. There would be nothing irregular in this course although it would be unusual, but the gravity of the case demands the adoption of extreme measures, for we take it, if this Order in Council proves irrevocable, that no officer of any standing in the Mercantile Marine will either remain in a degraded force or seek to enter it. Not so very long ago, in a discussion in Parliament on Colonel Jackson's case, Lord Northbrook told the House that every officer in Her Majesty's service had a right to petition Parliament, and that the House was bound to give such petitions a fair hearing. Should it be necessary to resort to this extreme measure it should be borne in mind that memorials or petitions for submission to Parliament must be handwritten and not printed.

We wish our Reserve subscribers would look up "Ex-C.'s" letter in the April number of this magazine. For the benefit of those who have not the magazine handy we will recapitulate his proposals—all the paragraphs, letters, and articles that have appeared in this magazine on the subject to be arranged and reprinted in pamphlet form, prefaced with a few explanatory remarks, and also with the necessary extracts from the Orders in Council of 1864 and 1891. Reserve officers to furnish their friends in both Houses of Parliament with copies for their information. It is obvious that any Member who would take the trouble to read the pamphlet—and many would do so—would be in a position to take an intelligent part in a debate on the subject, and would hardly be likely to accept as conclusive such an answer as that given last session by Mr. Forwood to Colonel Gourley when he drew attention to the matter in the House. We estimated the cost of producing a thousand copies at about £8, and we require a few more names to guarantee that amount before commencing to print,

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and we hope that they will be sent in at once, as the sooner the pamphlet is in the hands of Members the better. As the pamphlet will be sold at cost price, and the majority of Reserve officers are sure to invest in a dozen at any rate, the guarantors are not likely to be called upon to pay for more than the number they may require for circulation amongst their friends.

SOME Reserve officers seem to be entertaining the opinion that they are prevented by the Regulations from writing to the papers to ventilate their grievances or forming committees to get them redressed. This is a mistake, as a Reserve officer so long as he is not on active service is in the same position in regard to these matters as any other civilian. After this, those who are still doubtful of their position should obtain a copy of the Naval Discipline Act, which can be procured through any bookseller from Messrs. Eyre & Spottiswoode, the Queen's printers, for a shilling or eighteenpence and see for themselves. There is nothing in the Royal Naval Reserve Regulations on the subject. However, we wish to remind our Naval Reserve friends that so far as we are concerned their names are absolutely safe in our keeping, so long as an intimation to that effect is conveyed to us, and not even the rack or thumb screws would compel as to act as recently did one of our service contemporaries to an unfortunate correspondent who is now suffering the results of his misplaced confidence.

SERVICE CORRESPONDENCE.

LETTERS TO THE EDITOR.

[*The Editor desires it to be distinctly understood that he does not hold himself responsible for the opinions expressed by correspondents.*]

HONOURS AND REWARDS.

SIR,—In your last issue you reproduced the terms of the Royal Warrant, which empowers the Secretary of State for War to confer upon suitable recipients (who are, or have been volunteer officers) a distinction for long and meritorious services.

If it be Her Majesty the Queen's expressed desire to reward the officers of the volunteer forces, as set forth in the first paragraph of the Royal Warrant, in that case, neither Her Majesty's advisers, nor my Lords Commissioners of the Admiralty, can longer ignore or neglect the unequalled claims of the officers of Royal Naval Volunteers to a fair share of the

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rewards and distinctions which have been from time to time conferred upon the officers of the volunteer forces on shore.

It may appear unaccountably strange, yet nevertheless it is a patent fact, that from the first formation of the Naval Reserve to the present day, not a single officer of that branch of the service who had been actively employed at sea, and regularly complied with the regulations, has had the slightest recognition, either from the Board of Trade or the Admiralty, however lengthy his service, or however zealous in its performance he might have been. But, on the contrary, there has ever been, and it continues to the present day, an Arctic frigidity permeating every action of the Government in its every-day relationship with the officers of the Naval Reserve, their capabilities and aspirations are systematically ignored, and everything appears to be done to disparage the one, and to utterly crush out the other.

National expediency and discretion appear to tolerate the holding our position as officers, yet our very existence as such is only sustained on sufferance, and under the relentless frown of unapproachable officialism, which nullifies our rightful precedence and privileges at will, and transfers them to others whose pelagian knowledge is of a very mediocre description.

It has been unmistakably shown by many of your R.N.R. correspondents during the last twelve months, that had not the masters and officers of the Mercantile Marine Service come to the front and joined the Reserve at its first formation, it would have certainly "hung fire;" for at that time the Royal Navy and all connected with it was execrated by merchant seamen. It was only when their officers set them the example that their distrust of that Service subsided, and they joined the Reserve in numbers.

Rewards and distinctions were showered down upon the journalists and permanent officials who pulled the strings to set the Reserve afloat; but the officers who had in the main been instrumental in its flotation were left out in the cold, although there were amongst their number many on whom the mantle of distinction could have fallen, and who were capable of wearing it more becomingly than some of those to whom such distinctions were awarded.

As a retired lieutenant, whose commission dates from the year 1862, and who retired in 1886 on account of age, after 24 years' service, served in strict accordance with the then regulations, I felt at the time of my retirement that I had been

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unmercifully slighted in not having received some recognition for my services; my feelings were more than I choose now to express. I knew that I had performed my duties faithfully, and to the utmost of my ability, and had made more sacrifices for the benefit of the force and my country than I need have done. I had given for the free disposal of the State, at any time and in any part of the world, my whole "stock-in-trade;" that which had taken me a lifetime to acquire, in daily peril of my life in all parts of the globe, and upon which I had depended to earn my livelihood. Such "stock-in-trade" was a consummate knowledge of my duties as a skilled and competent master mariner, equally as capable as any then or now afloat. One part of the knowledge requisite to qualify myself as a Reserve lieutenant I then possessed and gave unreservedly to my country. My time (which meant my capital) I gave also to acquire the other part of the requisite knowledge. For 24 years I gave it without pay, reward, or consideration.

I do not want to ask anyone's opinion whether I am a volunteer or not. I know that I am one, by putting my hand in my pocket and finding myself deficient some thousands of pounds, which might have been there had I not freely and voluntarily surrendered my best services, in the palmy and best days of my manhood, to maintain the honour and safety of the country that I am pleased to call my own.

Do I regret it? No! A thousand times, no. But I *do* regret that the discriminative judgment of those in authority fails to recognise Naval Reserve officers as volunteers, and fails to accord them a fair share of the rewards and distinctions given so freely to others.

If we are not volunteer officers, what more must we give the country to qualify ourselves for that title?

I am sure the time has arrived when officers of the Reserve must perforce bestir themselves, and try to look after their own interests. We must have an organisation, or between the foster sons of the India Office, and the supine indifference of the Admiralty and the Board of Trade to our just rights, we shall go to the wall.

I remember the time when it was an honour to belong to the Reserve, when the dumb, blind, and spiritless were rigidly excluded from it; but now matters have decidedly changed, we are become more like the domestic cat in allowing our tails to be pulled with impunity by every juvenile, than like

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the "bull dogs" of old, upon whom it was dangerous to look with a scowl, or their collective bites would assuredly follow.

Nothing but a Select Committee of the House of Commons can satisfactorily deal with our grievances. Departmental committees have nearly ruined us, by their tinkerings and their want of knowledge of the subject. Ere Parliament meets in the spring, every member of the House should be in the possession of the fullest details of our grievances. They only need ventilating to ensure a remedy for them. We have many friends there who would be only too pleased to make our case their own (two, who write R.N.R. as an appendix to their names, especially). Who will help in this matter? is the anxious enquiry of a

RETIRED LIEUTENANT, R.N.R.

September 8th, 1892.

COLOURS TO BE WORN BY THE R.N.R.

DEAR SIR,—I was glad to see in a recent number of your valuable magazine, a question raised by one of your correspondents as to the colours to be worn by the Royal Naval Reserve, and I have since been watching for some comment on the subject in your subsequent numbers, but as none of your readers have so far responded, I venture to bring it forward again. The subject at first glance seems a trivial one, and scarcely worthy of agitation, but scattered as we are, and having so little cohesion as a body, anything that would tend to establish a little more *esprit de corps* would probably be cordially welcomed by all who have the real welfare of the Royal Naval Reserve at heart.

I believe I am right when I say that the Royal Naval Reserve have *not* got any colours of their own, and the sooner we establish them the better.

Now, the general idea is, I think it will be conceded, that the ribbon should have some analogy to that worn by the Royal Navy, but should, on the other hand be sufficiently distinct in its difference, to render it impossible to mistake it for that of the senior service; not that we pretend to be above wearing that most honourable distinction, but there might, and probably would be, some of the "pucka" Royal Navy who would object to it, or, at any rate, look on our doing so as an unwarrantable liberty, and it would not tend to make the R.N.R. more popular amongst their fighting brethren.

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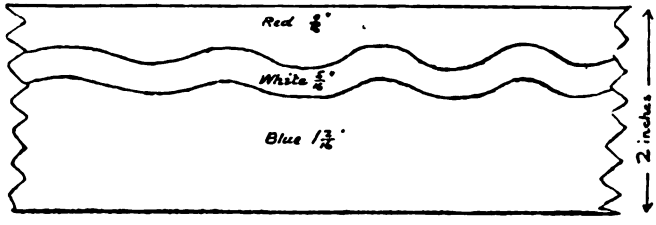
In the Army it is (at any rate, so far as my limited experience goes) unusual to say the least of it, for Militia Battalions of a territorial regiment, to affect the colours of their Line Battalions.

The Royal Navy at present possess two distinct ribbons, the one consisting of red, white, and blue, horizontal stripes of unequal width; the other of a plain blue band bearing a red embroidered naval crown.

I would suggest that we adopt the former, the distinction being that the white stripe should be waved the same as are the distinction stripes we wear on our sleeves—thus—



This would, I think, cause no unpleasantness with the "Regulars," as it could not be mistaken for their colours, and would at the same time bear sufficient resemblance to identify us as "of the guild."

Trusting that the subject will receive the attention of my brother officers,

I remain, &c.,

F.M.R.C.

Warley, Essex, September 21st, 1892.

[We cannot agree with our correspondent that any suggestion that is likely to tend to cohesion and the promotion of *esprit de corps* in the service is a trivial one and scarcely worthy of agitation; on the contrary, we think they are vital to the well-being of the Reserve movement, and we trust that this idea will now be taken up and definitely settled, say, before the end of the year. We hope to hear the views of some of the leading officers of the Reserve before long on the subject.—Ed. *N.M.*]

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO SEPTEMBER 3RD.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Agamemnon ...	6	380	D.S. Bat.-ship, 1st cl.	Capt. C. Johnstone	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	D.S. Bat.-ship, 1st cl.	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Australia ...	12	461	D.S. Cruiser, 1st class	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Bellona ...	6	168	D.S. Cruiser, 3rd class	Comm. H. D. Barry	May 14, 1892, Devonport	Channel Squadron.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Camperdown ...	10	...	D.S. Bat.-ship, 1st cl.	... ...	... ...	Portsmouth.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Collingwood ...	10	420	D.S. Bat.-ship, 1st cl.	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	.. ... Malta ...	Mediterranean.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Hecla	6	272	Torpedo Depôt-ship	Capt. Durnford, D.S.O. ...	Nov. 6, 1888, Portsmouth	Particular Service.
Howe	10	523	D.S. Bat.-ship, 1st cl.	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5, '89, Hong Kong	China.
Mercury ...	13	280	D.S. Cruiser, 2nd class	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Nelson	16	322	D.S. Cruiser, 1st class	Capt. Woodward, C.B. ...	Oct. 1, 1891, Portsmouth	Portsmouth.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Pylades ...	14	161	S. Cruiser, 3rd class	Comm. J. B. Young	Re-c. Nov. 13, '89, Bermuda	N. America and W. Indies.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	...	D.S. Bat.-ship, 1st cl.	Capt. Tynte F. Hammill, C.B.	... ...	Channel Squadron.
Sans Pareil ...	15	583	D.S. Bat.-ship, 1st cl.	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	D.S. Cruiser, 2nd class	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Trafalgar ...	10	550	D.S. Bat.-ship, 1st cl.	Capt. G. C. Robinson ... (R.-Ad. A. H. Markham.)	April 2, 1890, Portsmouth	Mediterranean.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.
Victoria ...	15	587	D.S. Bat.-ship, 1st cl.	Capt. Hon. M. A. Bourke ... (V.-Ad. Sir G. Tryon, K.C.B.)	Re-c. Ap. 29, 1890, Malta	Mediterranean.

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TIDE TABLES FOR OCTOBER, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields.		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown.		Kingstown.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
S	1	8 40	9 32	1 9	1 54	10 58	11 43	9 53	10 37	—	0 24	5 56	6 41	1 13	2 1	6 20	7 8	6 53	7 40	—	0 26	6 14	6 57	8 33	4 13	11 26	—
S	2	10 20	11 3	2 37	3 16	—	0 22	11 15	11 48	1 13	1 59	7 24	8 2	2 45	3 26	7 51	8 26	8 23	8 59	1 9	1 48	7 36	8 11	4 46	5 13	0 10	0 47
M	3	11 39	—	3 51	4 20	0 54	1 21	—	0 15	2 41	3 17	8 33	8 58	4 3	4 33	8 54	9 17	9 30	9 56	2 21	2 48	8 42	9 9	5 36	5 57	1 17	1 41
T	4	0 9	0 33	4 44	5 5	1 43	2 3	0 37	0 58	3 45	4 11	9 21	9 43	4 59	5 23	9 37	9 57	10 18	10 40	3 12	3 34	9 32	9 52	6 18	6 39	2 3	2 23
W	5	0 55	1 17	5 25	5 45	2 23	2 42	1 19	1 39	4 25	4 58	10 5	10 27	5 47	6 10	10 17	10 37	11 2	11 24	3 55	4 16	10 11	10 29	7 0	7 20	2 48	3 3
T	6	1 36	1 55	6 5	6 25	3 0	3 18	1 59	2 17	5 20	5 42	10 48	11 10	6 31	6 52	10 57	11 18	11 45	—	4 37	4 58	10 47	11 5	7 39	7 58	3 22	3 41
F	7	2 14	2 34	6 45	7 6	3 37	3 58	2 35	2 54	6 4	6 25	11 32	11 54	7 13	7 34	11 39	mid.	0 6	0 27	5 19	5 40	11 25	11 46	8 17	8 36	4 1	4 22
S	8	2 54	3 18	7 27	7 48	4 19	4 40	3 14	3 35	6 45	7 4	—	0 16	7 54	8 14	—	0 21	0 48	1 9	6 1	6 22	—	0 8	8 55	9 14	4 48	5 4
S	9	3 33	3 53	8 9	8 30	5 1	5 23	3 56	4 18	7 24	7 44	0 39	1 2	8 34	8 54	0 42	1 3	1 30	1 51	6 43	7 4	0 30	0 52	9 34	9 54	5 25	5 46
M	10	4 15	4 37	8 51	9 13	5 45	6 8	4 40	5 3	8 4	8 24	1 25	1 48	9 14	9 34	1 24	1 45	2 12	2 33	7 26	7 48	1 14	1 37	10 16	10 41	6 8	6 31
T	11	4 59	5 22	9 36	10 0	6 32	6 58	5 27	5 54	8 44	9 4	2 12	2 36	9 53	10 13	2 7	2 30	2 55	3 18	8 10	8 34	2 1	2 27	11 10	11 44	6 55	7 21
W	12	5 45	6 13	10 30	11 5	7 27	8 0	6 23	6 55	9 27	9 58	3 2	3 29	10 37	11 6	2 55	3 23	3 44	4 12	9 0	9 30	2 55	3 27	—	0 25	7 50	8 22
T	13	6 43	7 16	11 45	—	8 39	9 25	7 33	8 17	10 23	11 1	3 59	4 34	11 43	—	3 57	4 42	4 44	5 23	10 7	10 53	4 4	4 47	1 11	2 3	9 3	9 52
F	14	7 56	8 44	0 28	1 12	10 15	11 1	9 7	9 55	11 47	—	5 15	5 59	0 29	1 17	5 33	6 26	6 9	6 57	11 43	—	5 32	6 17	2 52	3 35	10 42	11 31
S	15	9 36	10 23	1 56	2 39	11 45	—	10 38	11 16	0 34	1 20	6 44	7 25	2 4	2 47	7 13	7 52	7 44	8 24	0 30	1 11	7 0	7 38	4 14	4 46	—	0 12
S	16	11 3	11 38	3 17	3 50	0 23	0 58	11 47	—	2 8	2 41	8 0	8 28	3 25	3 58	8 25	8 51	8 58	9 26	1 47	2 17	8 10	8 38	5 11	5 39	0 45	1 13
M	17	—	0 7	4 16	4 39	1 17	1 38	0 11	0 33	3 12	3 37	8 52	9 14	4 27	4 52	9 13	9 31	9 50	10 11	2 42	3 5	9 3	9 25	5 52	6 11	1 36	1 56
T	18	0 30	0 50	4 59	5 17	1 57	2 15	0 52	1 10	4 0	4 21	9 34	9 52	5 14	5 33	9 48	10 5	10 31	10 49	3 25	3 43	9 44	10 0	6 30	6 48	2 14	2 30
W	19	1 8	1 26	5 33	5 49	2 31	2 45	1 27	1 42	4 40	4 58	10 9	10 26	5 51	6 9	10 21	10 37	11 6	11 23	4 0	4 16	10 15	10 29	7 4	7 20	2 46	3 2
T	20	1 42	1 57	6 5	6 21	2 59	3 13	1 57	2 12	5 14	5 29	10 43	11 0	6 26	6 42	10 53	11 8	11 40	11 56	4 32	4 48	10 43	10 57	7 35	7 50	3 17	3 32
F	21	2 10	2 25	6 36	6 51	3 28	3 43	2 26	2 40	5 44	5 59	11 17	11 33	6 58	7 13	11 28	11 38	—	0 12	5 4	5 20	11 11	11 25	8 4	8 17	3 47	4 2
S	22	2 39	2 53	7 6	7 21	3 58	4 13	2 54	3 8	6 14	6 28	11 49	—	7 28	7 42	11 53	—	0 27	0 42	5 35	5 50	11 40	11 55	8 30	8 43	4 17	4 32
S	23	3 8	3 22	7 36	7 50	4 28	4 43	3 23	3 38	6 41	6 54	0 5	0 21	7 56	8 10	0 8	0 28	0 57	1 12	6 4	6 19	—	0 11	8 57	9 11	4 46	5 1
M	24	3 37	3 52	8 5	8 20	4 59	5 16	3 53	4 9	7 7	7 20	0 37	0 54	8 25	8 40	0 38	0 53	1 27	1 42	6 35	6 51	0 27	0 44	9 26	9 41	5 16	5 31
T	25	4 7	4 21	8 36	8 54	5 32	5 49	4 26	4 43	7 34	7 49	1 11	1 29	8 55	9 10	1 9	1 25	1 58	2 15	7 7	7 24	1 1	1 18	9 57	10 15	5 48	6 6
W	26	4 36	4 53	9 12	9 30	6 7	6 26	5 2	5 23	8 4	8 19	1 47	2 6	9 25	9 41	1 42	2 0	2 32	2 49	7 41	7 59	1 36	1 56	10 35	11 0	6 24	6 44
T	27	5 12	5 32	9 50	10 14	6 47	7 12	5 44	6 8	8 36	8 56	2 26	2 47	9 58	10 18	2 19	2 40	3 8	3 29	8 19	8 41	2 17	2 40	11 30	—	7 7	7 32
F	28	5 55	6 22	10 44	11 20	7 42	8 16	6 36	7 9	9 21	9 51	3 11	3 38	10 44	11 17	3 5	3 36	3 54	4 23	9 7	9 40	3 7	3 40	0 5	0 45	8 1	8 36
S	29	6 52	7 30	—	noon	8 55	9 41	7 49	8 35	10 20	11 14	4 10	4 47	11 57	—	4 14	5 0	4 57	5 38	10 22	11 7	4 19	5 1	1 31	2 20	9 19	10 5
M	30	8 13	8 59	0 42	1 24	10 27	11 9	9 23	10 8	—	noon	5 26	6 6	0 41	1 26	5 48	6 34	6 22	7 5	11 51	—	5 45	6 24	3 4	3 42	10 51	11 32
T	31	9 45	10 25	2 4	2 41	11 47	—	10 40	11 12	0 48	1 32	6 47	7 23	2 7	2 44	7 14	7 49	7 45	8 20	0 31	1 8	7 0	7 33	4 15	4 41	—	0 8

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 18	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 26	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbelltown	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 33	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 53	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 38	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 18	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 18	Devonport
Peterhead	−1 48	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 38	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 38	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−3 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 23	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Quessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 23	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
424	Scotland—E. Cst.—River Forth—Grangemouth	Temporary lights.
425	„ „ Moray Firth—Tarbetness	Alteration in light.
426	„ W. Cst.—Wigtonshire—Corsewall	Light altered.
427	North Sea—Jade River—Wangeroog Is.	Fog-signal repaired.
428	Baltic Entrance—The Belts	Buoys altered.
429	Baltic—Stockholm—Adkubb and Skotkobben	New lights.
430	„ G. of Finland—Aransgrund	Light-vessel, &c.
431	„ „ Kasper Bay	New light.
432	„ G. of Bothnia—Krakon and Lorudde	New lights.
433	„ „ Ulko Nahkiainen Shoal	Light-vessel, &c.
434	Norway—W. Cst.—Lodingen—Hjertholm	Light altered.
435	France—N. Cst.—Cherbourg	Occasional lights.
436	„ „ Héaux Lighthouse	Sunken rock.
437	„ W. Cst.—Iles de Glenan—Basse Rouge	Beacon re-building.
438	„ „ Plateau du Four—Goue Vas	Alteration in bell-buoy.
439	Mediterranean—Spain—Malaga	Position of W. Mole ligh
440	„ Linosa Is.—Point Strepito	Sunken rock.
441	„ Italy—Naples—San Gennaro Mole	Light discontinued.
442	„ Greece — Mandri Channel — Vrisaki Pt.	New light.
443	Red Sea—Jidda—Shab el Kebir	New beacon.
444	Africa—W. Cst.—Benguela Bay—St. Philip's Bonnet	Light altered.
445	„ E. Cst.—Delagoa Bay—English River—Reuben Pt.	Light altered.
446	India—Palk Strait—Tondi	New light.
447	Ceylon—Trincomali Bay—Foul Pt.	Sunken rock.
448	Bay of Bengal—Coringa Bay—Hope Is.	Discontinuance (temporary) of light after November.
449	Malay Peninsula—E. Cst.—Kuantan River	Light altered in position.
450	Eastern Arch.—Java Sea—Dua Is.	Sunken rock.
451	„ New Guinea—Adi Is. and Misol	Sunken rocks.

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side, has two masts and carries a frame globe at each masthead as day-marks. Approx. position, lat. 59° 58′ N., long. 24° 56′ 15″ E. *Variation*, 3° *W.* Also, the fog-sirens on board the light-vessel will give *four* blasts, each of *seven and one half seconds'* duration, *every minute.* Also, pilots are stationed on board this light-vessel, and the following signals are made:—*By day* (1) Flag C of the International Code signifies that a pilot is being sent to the vessel approaching. (2) Flag D signifies that there is no pilot present, or that one cannot be sent owing to bad weather. *By night*—A *red* and *white* light alternately with the pilot light signify the same as day signal No. 1. *Two white* lights at the main gaff, signify the same as day signal No. 2.

481.—BALTIC.—*Gulf of Finland.—Light on West Side of Kasper Bay.* —This light shows *green* from S. 11° E., through south, to S. 1° W.; *white* from S. 1° W. to S. 21° W.; and *red* from S. 21° W. through west, to N. 69° W., but is obscured seaward by Lopi point, when west of the bearing of S. 37° W., elevated 27 ft. above the sea, and visible 9 miles. Lighthouse, a square building, painted white, with a red roof. Approx. position, lat. 59° 36′ 20″ N., long. 25° 56′ 30″ E. *Variation*, 2° *W.* Exhibited annually from 27th July to 27th December.

482.—BALTIC.—*Swedish Shore.—Gulf of Bothnia.—Lights on Kråkön and Lörudde.*—Exhibited from the S.W. point of Kråkön, approach to Hudiksvall; and from Lörudde westward of the north end of Bremö:—(1.) KRÅKÖN LIGHT is a 6th order *Fl.* light, showing *white* from N. 20° W., through north, to N. 17° E.; *red* from N. 17° E., through east to S. 9° E. (but the light is obscured in part of this arc); and *white* from S. 9° E. to S. 5° E.; elevated 23 ft. above the sea; the white light visible 6 miles, and the red light 4 miles. Lighthouse, a small cylindrical iron building. Approx. position, lat. 61° 33′ 40″ N., long. 17° 20′ E. (2.) LÖRUDDE LIGHT is a 6th order *Fl.* light, showing *white* from S. 25° E., through south, to S. 23° W.; *red* from S. 23° W., through west, to N. 2° E.; and *white* from N. 2° E. to N. 11° E.; elevated 16 ft. above the sea; the white light visible 6 miles, and the red light 4 miles. Lighthouse, a small cylindrical iron building. Approx. position, lat. 62° 13′ 50″ N., long. 17° 40′ 30″ E. *Variation*, 7° *W.* Exhibited annually from 1st August to 15th December, and will not be constantly watched.

483.—BALTIC.—*Gulf of Bothnia.—Russian Shore.—Light-Vessel with Fog-Signal near Ulko Nahkiainen Shoal.*—With reference to Notice 286, p. 668. The light-vessel (*Nahkiainen*) is moored southward of the Ulko Nahkiainen shoal. It exhibits *two F. white* lights of 6th order, one at each masthead, elevated 34 ft. above the sea, and visible 7 miles. Light-vessel, painted red, with the word *Nahkiainen* in white letters on each side, has two masts, and carries a red flame globe at each masthead as day-marks. Approx. position, lat. 64° 34′ 50″ N., long. 23° 51′ 40″ E. Also the fog-sirens on board this light-vessel will give *four blasts*, each of *seven and one half seconds'* duration, *every minute.*

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426.—SCOTLAND.—*West Coast.—Corsewall Light, Wigtonshire.*—Referring to Notice 336, p. 577, the alterations being completed, the light (with increased power) is now exhibited and the temporary light extinguished. The character of the light is unaltered, viz., *Rev. white* and *red* alternately, *once a minute.*

427. — NORTH SEA. — *German Shore. — Jade River Entrance. — Wangeroog Island Fog-Signal.*—The repairs having been completed, the fog-signal on Wangeroog island is now given as heretofore. Approx. position, lat. 53° 47′ N., long. 7° 54′ E.

428.—BALTIC ENTRANCE.—*The Belts.—Seiero N.W. Reef and Lillie Ground Buoys.—Alteration in Characters.*—On 1st October, 1892, the following alterations will be made:—(1) Seiero N.W. reef buoy will be a *light* and *bell* buoy, painted white, with the words *Seiro N.W.* on it in red letters. The light will be an *Occ. red* light, visible about *five seconds*, and eclipsed about *ten seconds*, elevated 12 ft. above the sea, and should be seen 4 miles. Approx. position, lat. 55° 56¼′ N., long. 11° 3′ E. (2) Lille ground buoy will be a *light* and *bell* buoy, painted white, with the words *Lille Grund N.* on it in red letters. The light will be an *Occ. red* light, visible about *three and a-half seconds*, and eclipsed about *three seconds*, elevated 12 ft. above the sea, and should be seen 4 miles. Approx. position, lat. 55° 39¼′ N., long. 10° 37¼′ E.

429.—BALTIC.—*Swedish Coast. —Stockholm Approach.—Lights on Adkubb and Skötkobben.*—Exhibited from Adkubb and Skötkobben, southward and westward of Sandö, approach to Stockholm.—(1) ADKUBB LIGHT is *F.* showing *green* from S. 69° W. to S. 80° W.; *white* from S. 80° W. to S. 89° W., and *white* through an arc of about 27° in the direction of Skötkobben, elevated 21 ft. above the sea; the white light visible 6 miles, and the green light 2 miles. Ill. app. dioptric of 6th order. Lighthouse a cylindrical iron tower, painted white. Approx. position, lat. 59° 15′ 55″ N., long. 18° 54′ E. (2) SKÖTKOBBEN is a *F.* light, showing *green* from N. 30° W. to N. 12° W.: *white* from N. 12° W. to N. 8° W.; *red* from N. 8° W., through north, to N. 20° E.; and *white* from S. 21° E., through south, to S. 6° W., elevated 8 ft. above the sea; the white light visible 6 miles, the red 4 miles, and the green 2 miles. Ill. app. dioptric of 6th order. Lighthouse a cylindrical iron tower painted white. Approx. position, lat. 59° 17′ 15″ N., long. 18° 58′ 50″ E. *Variation*, 6° *W.* Exhibited annually from 1st August to 15th May, and are not constantly watched.

430.—BALTIC.—*Gulf of Finland.—Light-Vessel with Fog-Signal and Pilot-Signals South-Eastward of Aransgrund* —With reference to Notice 284, p. 667, this light-vessel (*Aransgrund*) is moored S.E. by E. ½ E., distant 2 miles, from the buoy marking Arans (Ny) grund, north shore of the gulf of Finland. It exhibits *two F. red* lights of 6th order, one at each masthead, elevated 34 ft. above the sea, and visible 6 miles. Light-vessel painted red with the word *Aransgrund* in white letters on each

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seen, the white light 14 miles, the green light 8 miles. Ill. app. dioptric. Lighthouse, 24 ft. high, consists of a square tower of masonry, with keeper's dwelling adjacent. Approx. position, lat. 37° 44′ 30″ N., long. 24° 5′ 15″ E. *Variation*, 6° *W.*

448.—Red Sea.—*Eastern Shore.—Jidda Approach.—Beacon on Shab el Kebir.*—A beacon has been erected on Shab el Kebir, northern approach to Jidda, to replace the beacon washed away by the sea. This beacon is an iron column, 30 ft. in height, surmounted by a ball, 6 ft. in diameter and painted red. It is seen in clear weather from a distance of 8 miles. Approx. position, lat. 21° 40′ 25″ N., long. 38° 50′ E.

444.—Africa.—*West Coast.—Benguela Bay.—Alteration in Colour of St. Philip's Bonnet Light.*—Recently altered from red to *white.* Approx. position, lat. 12° 34′ S., long. 13° 20′ E.

445.—Africa.—*East Coast.—Delagoa Bay.—English River.—Alteration in Reuben (Vermelha) Point Light.*—This light, on the northern side of entrance to English river, is now a *F.* light, showing *white* from S. 71° W., through west, to N. 79° W.; *red* from N. 79° W. to N. 73° W.; and *white* from N. 73° W., through north and east, to S. 66° E.; visible 15 miles. Approx. position, lat. 25° 58′ 50″ S., long. 32° 36′ E. *Variation*, 24° *W.*

Note.—In very clear weather Reuben point light may possibly be seen from eastward of Cockburn shoal.

446.—India.—*East Coast.—Palk Strait.—Light at Tondi.*—Exhibited from a steel mast erected close southward of the Custom house at Tondi, west shore of Palk strait; it is a *F. red* light, elevated about 63 ft. above the sea, and visible 10 miles. Ill. app. dioptric of 6th order. Approx. position, lat. 9° 44′ 45″ N., long. 79° 0′ 30″ E.

447.—Ceylon.—*East Coast.—Trincomali Bay.—Sunken Rock North-Westward of Foul Point Lighthouse.*—This rock (*Munayai Paru*), of small extent, with 6 to 7 fathoms around, is composed of coral; a least depth of 18 ft. at L.W. springs was obtained on it, but there is probably less water in places; it lies with Foul point lighthouse bearing S.S.E. ¾ E., distant 9¾ cables, and Norway island S.W. ½ W. Approx. position, lat. 8° 32′ 35″ N., long. 81° 18′ 45″ E. *Variation*, 1° *E.*

448.—Bay of Bengal.—*Coromandel Coast.—Coringa Bay.—Hope Island Light—Intended Temporary Discontinuance.*—To be discontinued from the month of November, 1892, until the end of the year (approximately). Approx. position, lat. 16° 49′ N., long. 82° 19′ E. Further notice will give the date of re-exhibition.

449.—Malay Peninsula.—*East Coast.—Kuantan River Entrance.—Alteration in Position of Light.*—The light, *F. white*, previously shown from the south side of Kuantan river entrance, has been shifted to the north side of entrance, elevated 28 ft. above the sea. Approx. position, lat. 3° 50° 15″ N., long. 103° 20′ 15″ E.

450.—Eastern Archipelago.—*Java Sea.—Sunken Rock Westward of Dua Island.*—Master of British barque *Arminia*, reports the existence of

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a pinnacle rock, with less depth than 21 ft. on it, and 14 fathoms around, situated in a position with West Dua island bearing about E ½ S., distant 6 miles, and east extreme of Pebelokan (West island) S. by E ⅛ E. Approx. position, lat. 5° 24′ S., long. 106° 22′ E. *Variation*, 2° *E.*

451.—Eastern Archipelago.—*Papua or New Guinea.—Sunken Rocks Northward of Adi Island and North-westward of Misol.*—The master of the Dutch steamer *Zeemeeuw* reports the existence of a coral rock, on which a least depth of 5 fathoms was obtaimed (but there is probably less water in the vicinity), of about one cable in extent N.E. and S.W., lying northward of Adi island, south coast of New Guinea, with east extreme of Adi island bearing S.S.E. ½ E., distant 9 miles, and north-west extreme of Adi island W. by N. Approx. position, lat. 4° 8½′ S., long. 133° 41½′ E. Also, the existence of a sunken rock eastward of Baru island, Kanari islands, wéstward of New Guinea. Approx. position, to be considered doubtful, lat. 1° 42′ S., long. 129° 46′ E. *Variation*, 2° *E.*

452.—China Sea.—*Banka Strait.—Intended Light on West Nangka.*—Probably in November, 1892, a light will be exhibited from a light-house on West Nangka, eastern side of Banka strait. It will be a *Fl.* light *every thirty seconds*, elevated about 186 ft. above the sea, and visible 20 miles. Obscured to eastward in certain directions by the other Nangka islands. Ill. app. of 2nd order. Lighthouse a twelve-sided iron tower, painted white, and 87 ft. high, situated on a hill, 98 ft. high, on the western side of the island, and surrounded by a white enclosure. Approx. position, lat. 2° 22′ 50″ S., long. 105° 45′ 35″ E.

453.—Yellow Sea.—*Pe Chili Strait.—Kwan Tung Peninsula.—Liau Ti Shan Promontory.—Intended new Light, and Provisional Light.*—A lighthouse is in course of construction on Liau ti Shan (Lao t'ieh Shan) promontory, south coast of Kwan Tung peninsula, from which a *double flashing half-minute white* light of 1st order will be exhibited. During the process of the works, a *F. red* light (dioptric of 6th order) will be shown from a wooden structure on the S.W. slope of the promontory. This light, visible in all directions except where obscured by the land, is elevated about 300 ft. above the sea, and should be seen 5 miles. Approx. position, lat. 38° 43¼′ N., long. 121° 9′ E.

454.—Japan.—*Gulf of Tokyo.—Yokoska Harbour Approach.—Sunken Rock North-Eastward of Katshi Ri' Ki Point.*—This rock of small extent, with a depth of 1¾ fathom on it at L.W., lies with the beacon on the reef (Sakune), north-eastward of Katshi ri Ki point, bearing S.W. ¾ S., distant one cable. Approx. position lat. 35° 18′ 5″ N., long. 139° 40′ 25″ E. *Variation*, 4° *W.*

455.—North Pacific.—*Sandwich Islands.—Oahu.—Honolulu Harbour.—Dredging Operations at Entrance.*—During the progress of the works for deepening the channel at the entrance to Honolulu harbour,

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which are being carried on night and day, lights will be shown by the dredger at night, and the following regulations should be observed by passing vessels:—(1.) The dredger shows *three red* lights triangularly placed, about 8 ft. apart, with a *white* light in the centre of the triangle, at an elevation of about 30 ft. above the sea. (2.) A steam-vessel approaching the harbour should stop at a safe distance from the dredger, and give one blast of the whistle, which will be answered by a single blast from the dredger, to be followed by three blasts from the dredger when the passage is clear, and the steamer may proceed. A tug will be in attendance, when not otherwise engaged, to assist sailing-vessels in passing the dredger.

456.—South Pacific.—*Friendly Islands.—Tongatābu.—Alterations in Buoyage of Egeria Channel.*—(1.) A fairway buoy, painted red and white in vertical stripes, is moored with south end of Atatá bearing S.E. by E., distant 9 cables, and Toke toke S.W. Approx. position, lat. 21° 2′ 50″ S., long. 175° 16′ 20″ W. *Variation*, 10° *E.* (2.) The white conical buoy, north-westward of Atatá, is replaced by a *conical* buoy, painted red. (3.) The red conical buoys, marking Friday and Johnnie shoals, is replaced by *can* buoys, painted black. (4.) The white conical buoy, marking Campbell rock, is replaced by a *conical* buoy, painted red.

457.—Alaska.—*Sitka Harbour Approaches.—Buoys and Beacons.*—(1.) A red *nun* buoy (No. 2) has been moored in a depth of 12 fathoms on the northern side of Zenobia rock. Approx. position, lat. 57° 0′ 10″ N., long. 135° 22′ 45″ W. *Variation*, 28° *E.* (2.) East beacon, on the highest part of the Eckholms, southern side of Eastern channel, is 20 ft. high and painted white. (3.) West beacon, on the southern side of Makhnati island, eastern side of Western channel, is 20 ft. high and painted white. (4.) A *nun* buoy, painted in horizontal stripes, has been moored in a depth of 10 fathoms, on the south side of Makhnati rock, and 3 cables South from West beacon. (5.) A black *can* buoy (No. 1) has been moored in a depth of 10 fathoms to mark Tsaritza rock, on the northern side of Eastern channel. (6.) A red *spar* buoy (No. 2) has been moored in a depth of 6 fathoms, to mark the northern end of the shoal surrounding Channel rock, western approach to Sitka harbour. From this buoy Channel rock beacon bears S.S.W., distant 1¼ cable. (7.) A black *spar* buoy (No. 1) has been moored in a depth of 5¼ fathoms, in a position with Channel rock beacon bearing S. by W. ¼ W. distant $1\frac{9}{10}$ cable. This buoy marks the northern side of the channel northward of Channel rock. *Variation*, 28° *E.*

458.—Alaska.—*Buoys and Beacons.*—These buoys and beacons mark various dangers on the coast of Alaska:—

(1.) *Nichols Passage.*—A red *nun* buoy (No. 2) has been moored in a depth of 10 fathoms, about a quarter of a cable north-eastward of Kelp rocks. Approx. position, lat. 55° 9′ N., long. 131° 39′ W. A black *can* buoy (No. 1) has been moored in a depth of 10 fathoms at the extremity

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of the reef at the west end of Gull island, westward of Village point. Approx. position, lat. 55° 8¼′ N., long. 131° 37′ W.

(2.) *Revilla Gigedo Channel.*—A black *can* buoy (No. 1) has been moored in a depth of 12 fathoms, one-third of a cable N.N.E. from the outer Hog rock. Approx. position, lat. 55° 11½′ N., long. 131° 21¾′ W. A black *can* buoy (No. 3) has been moored in a depth of 7 fathoms at the N.E. extreme of Spire island reef, westward of the north end of Bold island. Approx. position, lat. 55° 16′ N., long. 131° 30′ W. An iron beacon, surmounted by a barrel painted black and white in horizontal stripes, has been placed on the highest part of Cutter rock, eastward of Mountain point. Approx. position, lat. 55° 17¼ N., long. 131° 31¾′ W.

(3.) *Tongass Narrows.*—A red *nun* buoy (No. 2) has been moored in a depth of 3¼ fathoms, southward of Idaho rock, north-westward of the eastern extreme of Pennock island. Approx. position, lat. 55° 18¼′ N., long. 131° 36′ W.

(4.) *Clarence Strait.*—An iron beacon, 20 feet high, surmounted by a barrel painted black and white in horizontal stripes, has been erected on the highest part of Lincoln rock. Approx. position, lat. 56° 3½′ N., long. 132° 42¾′ W.

(5.) *Chatham Strait.*—An iron beacon, 20 ft. high surmounted by a barrel painted black and white in horizontal stripes, has been erected on the highest part of Hanus reef. Approx. position, lat. 58° 9¼′ N., long. 135° 6¼′ W.

(6.) *Saginaw Channel.*—A *can* buoy, painted in horizontal stripes has been moored about a quarter of a cable eastward of Faust rock, north-eastward of Retreat point. Approx. position, lat. 58° 24¼′ N., long. 135° 1′ W.

(7.) *Lynn Channel.*—An iron beacon, 20 feet high, surmounted by a barrel painted black and white in horizontal stripes, has been erected on the highest part of Vanderbilt reef. Approx. position, lat. 58° 34¾′ N., long. 135° 6½′ W. *Variation*, 27° E.

459.—British Columbia.—*Vancouver Island—Dangerous Sunken Rock in Discovery Passage.*—H.M.S. *Warspite* reports the existence of a dangerous sunken rock (Warspite rock) lying about 1½ cable N.E. of the point (*Middle Point*) situated nearly midway between Race and Orange points, west shore of Discovery passage :—An examination of the locality made in H.M.S. *Nymphe*, shows that Warspite rock consists of a pinnacle, with 4ft. on it at L.W. springs, rising above a patch about 80 yards in extent within the 5 fathoms line. The danger is steep to on its north and east sides, and between it and the shore depths of 3 to 8 fathoms were found. The position is at times marked by kelp, but the tidal stream strong the kelp is run under and cannot be se lies with Middle point bearing S.W., distant 1½ cable, and Ra N.W. ⅝ W. Approx. position, lat. 50° 5′ 35″ N., long. 125° 19 *Variation*, 24° *E.*

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460.—British Columbia.—*Strait of Georgia.—Alterations in Entrance Island Light.*—Entrance Island light, *F. white*, now shows a sector of *red* light through an arc of about 7°, or from the bearing of West to W. $\frac{5}{8}$ N., over Gabriola reefs, and is obscured southward of W. $\frac{5}{8}$ N. by Flat Top and Gabriola islands. Ill app. dioptric of 5th order. Approx. position, lat. 49° 12¾′ N., long. 123° 38¾′ W. *Variation*, 28° E.

Note.—Vessels approaching from the southward, should not alter course to the westward until Entrance island light changes from red to white, or when bearing West, which leads about 5 cables northward of Gabriola reefs buoy.

461.—British Columbia.—*Vancouver Island.—Barclay Sound.—Sunken Rock in Bamfield Creek.*—The commander of the steamer *Sir James Douglas* reports the existence of a rock, with a depth of 6 ft. on it at L.W. springs, lying nearly in mid-channel, about half-way from the entrance to the anchorage in Bamfield creek, east side of Eastern channel, Barclay sound. The rock lies with the centre of Rance island bearing about S.S.E. $\frac{3}{8}$ E., distant 4¼ cables, and vessels should pass eastward of it. Approx. position, lat. 48° 49′ 40″ N., long. 125° 8′ 15″ W. *Variation*, 28° *E.*

462.—North America.—*U.S. Pacific Coast.—California.—Magdalena Bay.—Shoal in Marcy Channel.*—Commander E. H. Blair, H.M.S. *Pheasant*, reports that when passing through Marcy channel, between Magdalena and Almejas bay, a sounding of 5 fathoms was obtained, in a position with Lengua point beacon bearing S.E. by E., distant $2\frac{3}{10}$ miles, and Deering bluff N.E. ½ E. Approx. position, lat. 24° 32′ 85″ N., long. 111° 51′ 45″ W. *Variation*, 11° *E.*

463.—West Indies.—*Bahamas.—South Caicos Island.—Cockburn Harbour.—Amended Arc of Visibility of Light.*—With reference to notice in 1890, East Harbour light, Cockburn harbour, is visible through an arc of 270°, or from South, through west and north, to East. Approx. position, lat. 21° 30′ N., long. 71° 30¼′ W. *Variation nil.*

464.—West Indies.—*Great Bahama Bank.—Ship Channel.—Removal of North Rock Beacon, and Erection of Lighthouse.*—On 5th September, 1892, the beacon on North rock, Ship channel, would be taken down; a lighthouse is in course of erection on the rock. Approx. position, lat. 24° 52′ 30″ N., long. 76° 49′ 45″ W.

465.—United States.—*Delaware.—Delaware Bay.—Delaware Breakwater Front Range Light.—Alteration in Character.*—This is now an *Occ. white* light, visible *two and a-half seconds*, and eclipsed *two and a-half seconds.* Approx. position, lat. 38° 47′ 50″ N., long 75° 6′ 50″ W.

466.—Bay of Fundy.—*East Shore.—Yarmouth Approach.—Cape Fourchu Light. —Alteration in Character.*—With reference to Notice 228, p. 487—Cape Fourchu light is now a *Rev. white* light, showing *three bright rays*, with intervals of *twenty seconds* between their points of greatest brilliancy, followed by an interval of *forty seconds* (during the greater part of which the light is eclipsed), the complete revolution thus

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occupying *eighty seconds*. The provisional light has been discontinued. Approx. position, lat. 48° 47′ 30″ N., long. 66° 9′ 25″ W.

467.—NEWFOUNDLAND.—*East Coast.—Notre Dame Bay.—Light on Great Dunier Island.*—The Pyrites Company of Pilley Island have exhibited a light from Great Dunier island, northern side of entrance to Badger bay, Notre Dame bay. It is a *F. white* light, elevated 210 ft. above H.W., 15 ft. above the ground, and said to be visible 16 miles. Shown from a cupola on the roof of a small dwelling. Exhibited annually from 15th May to 31st December. Approx. position, lat. 49° 31′ 45″ N., long. 55° 82′ 30″ W.

468.—NEWFOUNDLAND.—*St. John's Harbour.—Alteration in Leading Mark.*—During the recent fire at St. John's, Newfoundland, the Custom house and Messrs. S. March and Sons' store were burnt down, and the leading marks into the harbour are now as follows:—(1.) *Day mark.*—A diamond-shaped mark, painted black, has been erected close to the site formerly occupied by the gable of March and Sons' store, with a placard behind having the words *Leading Mark* painted on it. The diamond in line with the centre cross of the Roman Catholic cathedral leads into the harbour. (2.) *At night.*—A *red* light is exhibited from a pole, situated a few yards eastward of the site formerly occupied by the Custom house. This light in line with the *red* light near the corner of the Congregational Chapel, N.W. ¾ W., leads into the harbour.

469.—NEWFOUNDLAND.—*West Coast.—Sunken Rocky Ridge between Martin and Broom Points.*—A dangerous rocky ridge, with several very shoal heads on it, extends from Whale rocks, one mile north-westward of Martin point, to the Brandies, one mile westward of Broom point. Vessels should not approach the coast between Martin and Broom points. Approx. position, Whale rocks, lat. 49° 46′ 30″ N., long. 57° 55′ 45″ W.

470.—CANADA.—*Cape Breton Island.—Sydney Harbour.—Amended Position of S.E. Bar Lighthouse.*—This lighthouse is situated with Roman Catholic church near N.W. Bar bearing N.W. ¾ N., distant $1\frac{1}{10}$ mile; and Roman Catholic chapel near Gillivray point E.N.E. (Ely). Approx. position, lat. 46° 12′ 25″ N., long. 60° 12′ 45″ W. *Variation*, 26° *W.*

471.—CANADA.—*Gulf of St. Lawrence.—Northumberland Strait.*—(1.) *Beacon Eastward of Cape Jourimain.*—This beacon, surmounted by a square cage, has been placed eastward of cape Jourimain, western side of Northumberland strait, in a position with cape Jourimain lighthouse bearing S.W. ¼ W., distant nearly 9 cables, and extremity of railway pier S. ¼ W. Approx. position, lat. 46° 10′ 15″ N., long. 63° 47′ 40″ W.

(2.) *Automatic Signal-Buoy Southward of Tryon Shoal.*—A whistle-buoy, painted red, has been placed south-westward of Tryon shoal, south coast of Prince Edward island, in a position with Crapaud front light-house bearing N.E. ¼ E., distant 5 miles, and Rice point S.E. by E. ¼ E. Approx. position, lat. 46° 8′ 40″ N,, long. 63° 32′ W. *Variation*, 28° *W.*

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(8.) *Charlottetown Harbour.—Non-Existence of Beacon on Canseau Point.—New Leading Mark.*—The white beacon which formerly stood on Canseau point, western side of entrance to Charlottetown harbour, has disappeared. The Lunatic Asylum, a conspicuous red brick building, with a tower, situated 3 cables westward of Falcon point, just open eastward of the end of the railway pier at Charlottetown, bearing N.E. by E. ½ E., leads southward and eastward of Middle ground. Approx. position, Lunatic Asylum, lat. 46° 15′ 30″ N., long. 63° 5′ 15″ W. *Variation*, 24° *W.*

OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
19th September, 1892.

THE following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

NOTE.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
1471	Ireland, E.: Kingstown Harbour	Corrections throughout. August.
2305	Norway W.: Sheet III., Stav Fiord to Romsdals Islands ..	Sectors of Grœsholmen and Skongnæs lights. August.
2694	France, W.: Channels between Ile D'Onessant and the mainland	General examination and correction. August.
1758	Spain, W.: Arosa and Ponteredra Bays	Eastward of Puebla Bay and Arosa Island. August.
72	Spain, S.W.: Port of Huelva, entrance to Tints and Odiel Rivers	Entrance to rivers; also La Cabezuela and La Ballena lights. August.
469	Spain, S.E.: Port of Alicante ..	Depth at entrance to port. August.
201	Adriatic: Sheet I., Gulf of Venice and Trieste	General correction throughout. July.
609	Africa, W.: Sketch of River Gambier, Sheet II.	New Chart. August.
934	Eastern Archipelago: Surabaya, Bali and Sapudi Straits, with anchorages, &c.	Amendments throughout; also compasses. July.
2661AB	China Sea, Northern portion: Western and Eastern Sheets ..	Macclesfield Bank and soundings north of it. August.
270	China Sea: Macclesfield Bank ..	Large corrections. August.
1459	Hong Kong Harbour	Additions. August.
127	Japan, Kiusiu, N.W.: Hirado-no-Seto to Simonoseki Strait ..	Iki sima and vicinity; also North and South Sira sima to coast. July.

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Chart No.	Title of Chart.	Nature and Subject of Correction.
140	Japan, Kiusiu, W.: From Mats'-sima to Atsusi no O-sima, &c...	West of Kiusiu and soundings in the vicinity. August.
536	Japan, Nipon, N.W.: Sadoisl and adjacent coast	Large corrections. August.
2436	Pacific, Lin-Kiu group: Okina-waisl, Port Unteng	Bearings to views. August.
2042	N. America, Breton Island: Sydney Harbour	New plan, South Sydney. July.
390	Newfoundland, N.: Pistolet Bay	Soundings and names in Sacred Bay. August.
1484	Wales: Plans of anchorages in Cardigan Bay, Barmouth, Aber-dovey, New Quay Bay, and Aberystwyth	New Chart. August.
1598	English Channel	Large corrections. August.
2308	Norway: Sheet VI., Brand Fiord to Lekō	Approaches to Folden Fiord. Sept.
2612	France, N.: Sheet XII., Trouville to Dieppe	Cape la Hève to Hoc Point. Sept.
2680	France, N.: Entrance of the Seine	Cape la Hève to Hoc Point. Sept.
1104	Bay of Biscay	Soundings westward of Finisterre. September.
1676	Greece: Gulf of Patras and Approaches	New Chart. August.
1578	Africa, S.E., central: Lake Nyassa (Southern portion)	New Chart. July.
358	Japan: W. Coasts of Kiusiu and Nipon, including the Korea Strait	Large corrections. July.
2001	Rio de la Plata: Monte Video Bay	Pta Lobos. September.

Agent for the sale of Admiralty Charts, Mr. J. D. Potter, 31, *Poultry*, *London*, *E.C.*

Official Return of British Wrecks in August, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of August, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	46	9,800	82
Steam	13	6,162	Nil.
Total	59	15,962	82

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports received in August relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—George J. Swanston, Assistant-Secretary, Marine Department, Board of Trade, 1st September, 1892.

England.—*Dover Harbour, Signals.—Tidal Signals.*—(1.) For depth of water, by index at South Pier, 7 to 10 ft.—*Day-signal*—Red flag with a black ball under at the customary

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staff on the South Pier. *Night-signal*—A small low red light on the North Pier, and a similar light on the outer extremity of the South Pier.

(2.) For depth of water, 10 to 13 ft.—*Day-signal*—Red flag on the same staff. *Night-signal*—Two large red lights on the signal staffs of the South Pier, and the above-mentioned small low red lights on the North and South Piers.

(3.) For depth of water, 13 ft. and upwards—*Day-signal*—Red flag with a black ball over on the like staff. *Night-signal*—Lights as above.

(4.) A green light projecting its rays towards the harbour's mouth will be exhibited throughout the night near the entrance to the Granville Dock, and will show midway between the piers.

(5.) No signal to ships in general will be made between 7 ft. at ebb and 7 ft. at flood by the index board.

Signals to Vessels in the Offing, shown on South Pier-Head.—"You may enter Channel." *By day*—Dipping the signal-flag on South Pier-head mast. *By night*—Bright light shown under low red light, South Pier-head.

"Channel not clear, keep in the offing." *By day*—Flag on South Pier-head mast hauled down. *By night*—Green light shown under low red light, South Pier-head.

Signals during time when Dock Gates are Open, shown at Granville Dock Entrance.—"Channel not clear to vessels from seaward." *By day*—One black ball. *By night*—Two red lights (vertical). (This signal will be made when vessels are leaving Granville or Wellington Docks to keep Channel clear for them.)

"Channel clear from seaward." *By day*—A pendant. *By night*—Two bright lights (vertical). (Vessels in outer harbour are not to enter or cross the channel whilst dock gates are open until this signal is shown.)

(By Order), JAMES STILWELL,
Register of Dover Harbour.

THE Board of Trade have awarded a silver medal to Gustave Denis, gendarme at Blaye, near Bordeaux, in recognition of the assistance he rendered to the survivors of the crew of the steamship *Petrolea*, of London, on the occasion of the destruction of that vessel by fire on the 14th June last.

THE Board of Trade have awarded a gold watch to Mr. D. H. Rivers, master of the American ship *A. G. Ropes*, of New York, in recognition

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of his humanity and kindness in rescuing the shipwrecked crew of the barque *Glanperis*, of Carnarvon, which was abandoned off Cape Horn on the 22nd May last. The Board have also made the following awards to those who manned the rescuing boat belonging to the *A. G. Ropes*, namely:—Gold shipwreck medals to Mr. Henry Graham, 2nd mate, and Mr. Christopher Lawrence, 3rd mate, and silver shipwreck medals and a sum of £3 each to Martin Petersen, Frederick W. Best, Henry Dahm, and Nils Norman, seamen.

The Board of Trade have awarded a piece of plate to Mr. Laurent Boyer, master of the steamship *La Champagne*, of Havre, in recognition of his humanity and kindness in rescuing the shipwrecked crew of the barque *Alumbagh*, of London, which was abandoned in the North Atlantic on the 22nd August last. The Board have also awarded a gold shipwreck medal to Mr. Nicolas Blanquie, mate of the *La Champagne*, who was in command of the rescuing boat, and silver shipwreck medals and £3 each to the nine men who accompanied him in the boat, viz.:—Joseph Jacques Josse, Benjamin Dupart, Theophile Allain, Guillaume Furet, Emile Guerin, Louis Le Guluche, Pierre Le Pape, Mathurin Richard, Julien Le Merrer.

The Board of Trade have awarded a gold watch to Mr. Samuel B. Davis, master of the sailing-ship *Arlington*, of Yarmouth, N.S., in recognition of his services in rescuing the shipwrecked crew of the barque *Countess of Dufferin*, of Londonderry, in the North Atlantic on the 30th December last. The Board have also awarded a silver medal for gallantry in saving life at sea to Mr. James L. Hemeon, first mate of the *Arlington*, who was in command of the rescuing boat; and a bronze medal for gallantry and a sum of £3 each to the seamen Daniel Keefe, Frank Sullivan, and Thomas Cleary, who accompanied him in the boat.

The Board of Trade have awarded a gold watch to Mr. Theodor H. N. Langhinrich, master of the German sailing-ship *Fritz Reuter*, of Hamburg, in recognition of his kindness and humanity to the shipwrecked crew of the barque *Wamphray*, of Glasgow, which was abandoned off Cape Horn on 19th October, 1891. The Board have also awarded a gold medal to Mr. H. G. J. Renck, mate of the *Fritz Reuter*, who was in command of the boat that rescued the shipwrecked men, and silver medals and a sum of £2 each to the six seamen who accompanied him in the boat, viz:—F. O. R. Dourin, E. A. F. Helmrich, R. J. Leuitz, N. S. Nyländer, F. H. Wieser, and F. A. Fred.

Official Inquiries at Home, 1892.

4574. *Wilberforce*, s.s.; built at South Shields, 1882; owned by Mr. R. Harrowing and others; tonnage, 967; loading at Swansea; general cargo and coal; explosion of coal gas in No. 1 hold, whereby

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one life was lost, June 18, 1892. Inquiry held at Sunderland, August 20, 1892, before Wilson and Cameron, Justices; Knox, Castle and Parfitt, N.A. Casualty owing to a naked light having been brought into contact with gas. The usual means existed to ensure surface ventilation, but coal was of a fiery nature, and no warning was given by the shippers.

4577. *Alice*, ketch, and *Refulgent*, s.s.; former built at South Town, Suffolk, 1860; owned by Mr. G. H. Anderton; tonnage, 75; Teignmouth to Goole; pipe clay; latter built at Sunderland, 1881; owned by Mr. J. Westoll and others; tonnage, 619; London to Tyne; ballast; in collision off Dudgeon Lightship, August 8, 1892, when former sank and three lives were lost. Inquiry held at Newcastle, August 26, 1892, before Brounе and Woods, Justices; Parish, Hore and Dyer, N.A. Collision owing to no look-out having been kept on the *Refulgent*, the chief officer having left the bridge, and the helmsman having been prevented by the sails from seeing anything on the lee-bow. Certificate of mate suspended for twelve months; recommended for one as second mate.

4581. *Mendelssohn*, s.s.; built at Sunderland, 1890; owned by Mr. J. Taylor and others; tonnage, 1,668; Garston to Baltimore; ballast; stranded near Kearney Point, Co. Down, August 18, 1892. Inquiry held at Belfast, September 2, 1892, before Eaton, Judge; Anderson and Bain, N.A. Casualty owing to master neglecting to verify his position off the Chicken Rock light, steering a course too close to the coast, being absent from deck, and failing to leave proper instructions. Certificate suspended for three months.

4582. *Alicia*, s.s.; built at Middleton, 1880; owned by Mr. R. Ropner and others; tonnage, 928; Tyne to Cronstadt; coal; stranded 40 yards N. of Kullagrund Beacon, Baltic, May 9, 1892. Inquiry held at West Hartlepool, September 2, 1892, before Irvine and Lauder, Justices; Richardson and Bragg, N.A. Casualty caused by course set not being made good, and by second mate not keeping a good look-out, and to his not knowing on which side to pass the beacon. Certificate suspended for three months. Master blamed for not leaving instructions with regard to beacon.

Official Inquiries Abroad, 1892.

4567. *John McLeod*, ship; stranded on Pratas Shoal, May 28, 1892. Inquiry held at Hong Kong, June 24, 1892. Casualty brought about by the uncertain currents in the vicinity.

4568. *Katoria*, s.s., and *Sutherland*, s.s.; in collision in Hooghly, June 2, 1892. Inquiry held at Calcutta, June 27, 1892. Collision owing to *Katoria*, which was going down with the tide stern foremost, not going full speed ahead quite soon enough; and to *Sutherland*, which was steaming up the river, not going full speed astern quite soon enough.

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4569. *Ringdove*, schooner; capsized and foundered off Half Moon Cay, June 2, 1892, when nine lives were lost. Inquiry held at Belize, June 20, 1892. Casualty caused by a heavy squall.

4570. *Union*, s.s.; wrecked on Richmond River Bar, April 28, 1892. Inquiry held at Sydney, June 13, 1892. Casualty owing to master attempting to enter river at an improper time of tide. Certificate suspended for three months.

4571. *Grace Lynn*, schooner; wrecked on Richmond River Bar, June 3, 1892. Inquiry held at Sydney, June 20, 1892. Loss owing to the intricacies of the channel.

4572. *Millie* and *Waratah*, ferry steamers; in collision in Sydney Cove, June 11, 1892. Inquiry held at Sydney, June 27, 1892. Collision caused by master of *Millie* leaving engineer to steer vessel. Certificate suspended for three months.

4573. *Palatine*, s.s.; stranded near Alexandria, July 2, 1892. Inquiry held at Alexandria, July 28, 1892. Casualty owing to vessel's distance from shore having been misjudged when she was laid to for the night; to second mate waiting half-an-hour after relieving mate before taking bearings, and to his neglect to call master when he found vessel was fast drifting towards shore. Certificate suspended for six months.

4575. *Flinders*, s.s.; stranded E. of River Forth, Tasmania, June 25, 1892. Inquiry held at East Devonport, July 2, 1892. Casualty owing to second officer not properly carrying out the instructions given him. Certificate suspended for three months.

4576. *Barangaroo*, s.s., and *Lilian*, s.s.; in collision in Port Jackson, June 11, 1892. Inquiry held at Sydney, July 12, 1892. Collision owing to master of *Lilian* porting when the green light of the *Barangaroo* was in sight whilst the vessels were crossing.

4578. *Chiloe*, s.s.; stranded off East Rock, Tumbe's peninsula, July 2, 1892. Inquiry held at Valparaiso, July 11, 1892. Vessel, which stranded during hazy weather, evidenly experienced an unusually strong southern current. A fog-signal on Quiriquina Island would have given timely warning of danger.

4579. *Haiphong*, s.s.; stranded 2 miles W. of Iro-o-saki Light, June 28, 1892. Inquiry held at Hong Kong, July 15, 1892. Casualty owing to master not obtaining the latest charts, which would have warned him of the indraught which vessel experienced, and to the neglect of the lead. Certificate suspended for two months.

4580. *Charles and Arthur*, brigantine; stranded on Wanganui River Bar, May 20, 1892. Inquiry held at Wanganui, N.Z., June 7, 1892. Casualty caused by master sailing his ship in against the signals. Ordered to pay costs, £3 15s. Signals at present in use misleading.

4583. *Glenmore*, s.s., and *Lady Downshire*, s.s.; in collision near St. Elmo Point, Malta, August, 24, 1892. Inquiry held at Malta, August 26, 1892. Collision owing to master of *Glenmore* not keeping a proper look-out, steering too close to the land on his port-side when

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entering harbour, and not keeping out of way of *Lady Downshire* which he had on his starboard-side. Certificate suspended for two months; recommended for one as mate.

NOTES.

It is seldom that the actual value of taking precautionary measures to avoid mishap can be realised. The measures adopted may or may not be the means of averting some disaster, but it is generally impossible to learn the real effect. A correspondent calls our attention to an incident in a recent passage across the Atlantic, when Captain Dutton, of the Cunard *Servia*, was going dead slow in a dense fog. Suddenly the steamer came into collision with another vessel, but the blow was a very slight and sliding one; the steamer's engines were at once stopped, and Captain Dutton spoke to the master of the American ship *Undaunted*, who reported that his ship had received no damage and he required no assistance. This was the result of taking the precaution to go dead slow in a thick fog, and we record the incident here that Captain Dutton may have due credit for his prudent and judicious action, and also that less scrupulous and more hasty master mariners may be informed of the advantage of exercising prudence and caution in time of fog.

Two important events in connection with the Atlantic passenger service have taken place this month, the launch of a Cunarder considerably larger than any other steamer afloat, and the completion of an arrangement by which one of the most important lines will use Southampton as its British sailing port. The well known *Inman* line became a few years ago the *Inman and International*, it being understood that with the change of name a large amount of American capital was brought into the concern. This was soon followed by the building of two very fast twin-screw steamers, the *City of New York* and *City of Paris*.

The next step towards the complete Americanisation of the line was the passing of an Act of Congress by which the two steamers are allowed to be registered under the American flag,

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and receive a large retainer as war cruisers. Their registry as American ships is, however, on condition that two vessels at least as large are built in the United States for the company. It is now announced that the International Navigation Company (a new name for the American part of the concern) has concluded a contract for the conveyance of the United States Mails *viâ* Southampton.

It has been long seen that as the cargo carried by the large steamers became of less and the passengers of more importance, a port nearer London would be able to compete with Liverpool. It will take about the same time to reach Southampton from the Atlantic as Liverpool, but a saving of time and trouble will be effected by the shortness of the journey to London, and also by the fact that the railway station adjoins the landing stage.

It is also announced that the South-Western Railway Company have acquired the Southampton Docks, and hence the dock business there will be no longer hampered for want of capital. The harbour authorities have also undertaken to improve the lighting and buoying of the harbour, and to deepen it so as to maintain a depth of 30 ft. at low water neap tides. The railway company have also acquired from the town authorities sufficient mud lands to construct a graving dock to take the largest steamers. The sailings will be weekly, and will commence in March next, and by that time the whole scheme will be in working order.

The new Cunarder, the *Campania*, launched from the Fairfield yard on the Clyde on the 8th September, has a tonnage of 12,500 gross, as against 10,000 of the *Teutonic* and 10,500 of the *City of Paris*. Her length is 620 ft., beam 65 ft. 3 ins., and depth 43 ft. She will be propelled by triple-expansion engines, which are expected to develop over 15,000 horse-power, and will have twin-screws, the shafts being carried for their whole length within the body of the ship.

The work hitherto done on the Mersey Bar has been so successful that the Dock and Harbour Board have resolved to expend an additional £10,000 in further experiments in the same direction.

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It is announced that the Government have placed at the disposal of the United Service Institution a piece of ground adjoining the late Chapel Royal at Whitehall as a site for the erection of a lecture-room and offices. This, with the addition of the fine building, late the Chapel Royal, as a museum, will furnish ample accommodation for the society. It is, however, necessary to spend some thousands in building and fitting, and for this an appeal is made for subscriptions. It is to be hoped that this useful Institution, which serves an important national purpose, will obtain the money required.

A very valuable paper on the applications of electricity in the Royal Navy was recently read before the Institution of Mechanical Engineers by Mr. Henry E. Deadman, Chief Constructor, Admiralty. The author divided his subject into search lights, internal lighting, including temporary installations, torpedo and gun circuits, electric communications, and other applications. The portion relating to internal lighting is of such interest that we reproduce it for our readers' benefit, and shall, when space permits, in future numbers give some further extracts from the paper :—

"Electricity is at the present day largely resorted to for the purpose of lighting internally the vessels of the Navy ; all the larger vessels, such as battle-ships and first and second-class cruisers, are now so lighted. Moreover, this mode of lighting is not restricted to the habitable portions of the ship, but is carried out to the complete exclusion of other modes, although the latter may be fitted as a reserve. Thus the electric lighting is extended to machinery spaces, coal bunkers, magazines, shell rooms, store rooms, gun quarters, &c., as well as to the illumination of compass cards, telegraph dials, bow and mast-head and signal lanterns, semaphores, &c. Clusters of glow lamps beneath an enamelled metal reflector are also employed for lighting the upper deck, when coaling or other operations are being carried on at night. In a large battle-ship like the *Royal Sovereign* there would be about 800 of these glow lamps, necessitating for this system alone about 8 miles of electric leads, which are equivalent to something like 155 miles of copper wire of varying sizes, principally No. 20 legal standard wire-gauge or 0·036 inch diameter.

"*Progress.*—The first installation of internal lighting in the Navy was carried out on board the *Inflexible* in 1881 by the Anglo-American Brush Co. It was a combined system of arc and glow lamps. The dynamos used were of the Brush type, of which the first specimen brought to this country was purchased by the Admiralty, and is still in

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use in Portsmouth dockyard. Each machine was capable of maintaining sixteen Brush arc-lamps of 2,000 candle-power each. The lamps had double sets of carbons, each pair burning eight hours. These arc lamps were switched on and off by a switch opening and closing a shunt circuit of small resistance. With this plan it is evident a lamp could not be safely handled while the current was on, even if the light was switched off, because the lamp itself still formed a part of the circuit. A switch was accordingly devised in the dockyard, by means of which the lamp could be cut completely out of the circuit. The Swan glow lamps were fitted in sets of eighteen in series, each set being placed in parallel between the main circuits of the arc lamps. Each glow lamp was fitted with an automatic cut-out, bringing into the circuit a resistance equal to about that of the lamp, in case the latter failed. This system now no longer exists in the *Inflexible*, an installation on modern methods having been substituted for it.

"The five Indian troopships were next fitted throughout with glow lamps by the Edison Company, who used the Edison Hopkinson type of dynamo giving a current of 180 ampères at 110 volts. The *Polyphemus* was also entirely fitted by Messrs. Siemens, and the *Colossus* by the Brush Co., the dynamos in the latter being of the Victoria Brush type. The *Polyphemus* was the only ship in the Navy fitted on the single-wire system. Afterwards the adoption of internal lighting became general; all new vessels except the smaller cruisers were fitted, as were also the previous vessels on the first opportunity of their coming in for repairs and refit. There are now in the Navy about 300 vessels either fitted or being fitted with electric lighting, for search lights or internal lighting or both.

"*Difficulties.*—The earlier installations, although quite satisfactory so far as the illuminating effect was concerned, were certainly not satisfactory in regard to the endurance of the plant; in fact, they were a constant source of trouble, both the dynamos and the leads requiring frequent repairs or renewals. These troubles arose partly from faulty construction, and partly from the conditions necessarily existing on board ships of war, such as the necessity for placing the dynamos well down in the ship, and under protection from shot: which regulated them either to the engine room with its high temperature and moist temperature, or to some other confined and ill-ventilated spot. Under these conditions the insulation soon suffered, and the machine quickly got out of action. The leads throughout the ship suffered too from access of salt water, which caused much trouble by destroying the insulation, and producing short circuiting, thereby frequently setting on fire the wood casing in which the leads were laid, or any other inflammable material in the neighbourhood.

"*Remedies.*—Nearly all these difficulties have in the course of time been surmounted. While it is still necessary to place dynamos under

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protection for use in action, it has now become the practice to fit an additional dynamo, capable of running all the lights generally required at one time, and to place it with its motor in an open space between decks, or on the upper deck suitably sheltered. This is known as the peace or daylight dynamo. The introduction of lead-coated wires marked an epoch in ship-lighting; and these wires are entirely used in all the later installations, and are taking the place of the old leads as fast as the latter require renewal. These cables dispense entirely with the wood casings previously used, resulting in greater simplicity of fitting as well as increased efficiency. The wood casings are still used in America even with the lead-coated cables; but in the writer's opinion, while adding largely to the cost of the installation, they are likely to detract from its efficiency, as they form such convenient receptacles for water to lodge in."

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THE

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MODERN MAIL STEAMERS.

THE literature on this subject is already very copious, and some apology is perhaps due for increasing it. If, however, we divide this literature into two classes, the "congratulatory descriptive," and the "critical," we shall find the former to be very large in amount, and the latter very small. Indeed, but little of a critical nature has appeared since the late Mr. John, M.I.N.A., read his paper on Atlantic Steamers some few years ago. In our last month's *Nautical*, we referred to the launch of the Cunard Company's steamer *Campania;* this event produced the usual "chorus of congratulation" in the newspapers, and also a considerable amount of correspondence on the question of the originality of certain so-called improvements adopted. The occasion is, therefore, opportune for dealing in a critical manner with some of the features of the modern mail steamer.

The present accepted type of mail [illegible] to date from 1870, with the *Oceanic* [illegible] is still in active service in the [illegible] speed is little inferior to any [illegible] In her proportions and general desi[illegible]

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from the prevailing type. She was very narrow, the ratio of $\frac{L}{B}$ being about 10, and at that time she was much criticised. As a matter of fact, her proportions, which have been adhered to in succeeding vessels of the same service, have been justified by experience. The mistake is not infrequently made of attributing a want of stability to vessels of small relative beam and depth. Really, it is more the disposal of the weights which determine the amount of stability, and many instances might be given of mail steamers that cannot be kept on their legs when in the light condition. The *Oceanic* had four masts, three of which were square rigged, and she carried an enormous spread of canvas. She was, we believe, the first ocean steamer built with a top-gallant forecastle, long raised promenade-deck amidships, and full poop. The forecastle-deck and poop-deck were built with turtle backs. The saloon and cabin accommodation were amidships. The promenade-deck was carried on a long deck-house and supported at the sides by a continuation of the frames. The foregoing description would apply to most of the mail steamers built since then. At first, the new type was not generally accepted, and many steamers were built with flush upper-deck and barque rigged. At present the accepted type of mail steamer as exemplified in the latest P. & O., Orient, Pacific, White Star, Cunard, and other services, is but a modified *Oceanic*. Since she was built steel has replaced iron, various forms of constructional work have been introduced, and the propelling machinery has also been improved. Progress, however, has not been rapid, and the tri-compound engine, as invented by Messrs. Fleming and Ferguson in 1872, and improved by the late Dr. Kirk in 1874, has altered but little in the interval. As regards the improvements in shipbuilding these have been the result of a ceaseless war against prejudice. Thus for many years frames could only be made of angle bars and reverse bars, and when bars of Z section were introduced there was great opposition to their use. The Admiralty had used such bars made of steel long before they were adopted in the mercantile navy. It is hardly necessary to say that for the same sectional area the Z bar is much superior to the angle and reverse frame. The same is true of the use of channel bars for frames and beams, they are, however, handicapped quite unnecessarily. It is very curious to see the use of Z and channel sections in the new Cunard steamers put forth

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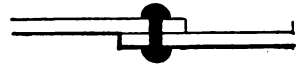
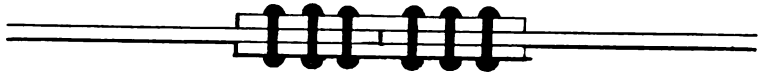
as an "improvement," considering that such sections have been used for the last ten years. Another "innovation" adopted in the new Cunarder is the lapped butt in the shell plating. As this question of butts is often debated it may be as well to say something about it. In joining two plates the kind of joint will depend upon the strength required and the purpose to be achieved. The weakest joint is the ordinary single lap,



and the strongest the treble riveted double butt. In the



former the percentage of strength will be from 45 to 50, and in the latter as much as 85 and 90 per cent. can be obtained. For ordinary ship work the double or treble riveted single butt is employed thus—

The joint is used in the shell plating of the hull for vessels up to a certain size, but in the sheer-strake bilges, and in the keel plates, treble riveted butts are used. In cases where the plating number is beyond 28,000 all the joints are to be treble riveted. It needs little consideration to see that the strap means a considerable addition to the weight of the hull, and when, as in the case of the largest steamers, double butt straps are necessary, it becomes evident that strength means much weight, it also means increased resistance. This was well shown by the *City of Paris* and the *City of New York*—they have the shell plating united by treble riveted double butt straps, and the outer skin instead

of being flush and smooth was ridged by these outside butt straps. Not only was the wetted area thereby augmented, but the resistance to propulsion greatly increased. We have heard it stated that this resistance meant more than 1,000 I.H.P. Whether this is so or not, it was considered necessary to

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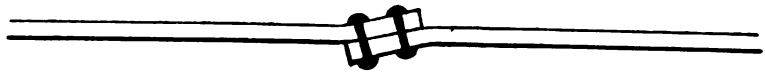
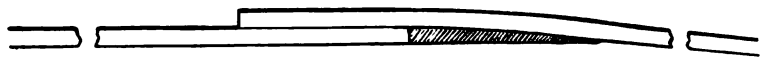
diminish as much as possible the effect of these outside straps, and this was done by fitting to each edge of the strap liners or filling pieces thus. If we take the two joints mostly used, the single lap and the double riveted butt, and expose them to a tensile strain, we shall see the lap joint assume this shape,



that is, the axes of each plate coincide; the material disposing itself symmetrically with the axis of the force. If we expose the butt joint to a tensile strain we find it assume this shape.

Here as before, the material endeavours to place itself symmetrically, and in so doing opens the butt, bends the strap and the plates. Of course our sketches are purposely exaggerated, but something of what we have described can often be seen taking place on the bilges and gunwale plating of cargo steamers which just touch the A 1 class. When in addition to a tensile strain there is also the racking strain set up by rolling, &c., it is not surprising that in vessels built to a classification, seams occasionally leak. Of course, absolute deformation of the joint seldom occurs.

With a view of saving weight and material, and also to facilitate rapid production, the lap butt was introduced some 40 years ago, but to make two such plates "fay" with those above it, it was necessary to insert a "liner" or filling piece



thus; this did away with the butt strap, but when such a joint was stressed it manifested a tendency to become thus:—

As the form of lap joint or "lap and liner," as it was termed, was but little superior to the butt strap, it did not come into general use. It is, however, interesting to note that the plating of the steamer *Tiber*, built in 1851, by

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Mr. John Reid, of Glasgow, was on this system. When petroleum in bulk steamers became common, it was soon realised that something as strong as the double butt was required without its weight, and the only method was that introduced by Mr. Wilson, of the firm of Harland & Wolff, of Belfast; the Wilson joint is so made, that on the application of a tensile strain it preserves its shape, the edges of the plates are bent out and in, thus: when butted and riveted they take

the shape which is that taken by the ordinary single lap *after* the latter is strained. To get over the difficulty of making two

adjoining strakes of plating "fay" with each other, Mr. Wilson invented a special machine, which is used in every builder's yard where modern high-class work is done. This machine planes out a wedge-shaped piece, so that at the edge of two lapped plates there is a fair line. This machine thins the projecting lap at the edge. The advantages of this joint are: no deformation, a saving in weight, and a gain in strength. As an example, take in all cases treble riveted double butt straps with $\frac{3}{4}$" plate and $\frac{7}{8}$" rivet as unity, then the strength of Wilson's lap is 98 per cent., that of the liner lap 87 per cent., while the ordinary treble riveted single butt is but 23½ per cent. It is found that a treble riveted Wilson lap is equivalent to a double strap double riveted, while the saving in weight is about 55 per cent. We have dwelt upon this question of butts at some length as the occasion is opportune. Where, as in modern mail steamers, it is necessary to have the maximum of strength with the minimum of weight, there cannot be any question as to the method of framing and plating. We see that in the most recent mail steamers Z and [sections and lapped butts are uniformly used. In the Royal Navy these sections have been so used for years. Lapped butts are, however, not yet employed in the sister service except for torpedo boats and catchers. When the skin plating is at all thick the projecting lap would cause an otherwise glancing shot to effect penetration. Those firms of builders which may be said to "form practice," such

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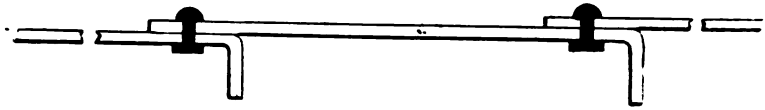
as Harland & Wolff, Denny's, Naval Construction Co., Lairds, Armstrongs, Yarrow, &c., adopt the method we have described almost exclusively. Without taking any particular side, we may state that in adopting lapped butts and enclosed shafts in such a large vessel as the *Teutonic*, Messrs. Harland & Wolff showed great confidence and boldness. Remembering how one huge failure of a ship to do what she was designed for meant commercial and professional ruin to not a few, and how quite recently a large new twin-screw steamer was the subject of a prolonged and costly arbitration suit, there is good reason for abstaining from anything in the shape of experiment in large vessels.

In the matter of bulkheads and subdivision generally the modern mail steamer is infinitely superior to the former class of vessel. But in the general design and arrangement of the material of the bulkheads, there is an almost slavish adherence to conventional treatment. Messrs. Thompson recognising this, made a decided improvement in the *City of Paris* and *City of New York*. In these steamers angle bars as vertical stiffeners are not used, but all and more than the advantages of angle bars are obtained by flanging the plates thus: this method



is certainly 10 years old, and in more than one private establishment, tests were made to demonstrate the superiority of this method of construction, but it is only quite recently that it has received official approval. In general, vertical and horizontal stiffeners of angle bars are but of little use in staying a bulkhead deep girders well secured at their extremities are now adopted. Some tests recently made under Lloyd's inspection have demonstrated conclusively the great superiority of flanged plates over angle bars. For oil steamers flanged plates may be said to be a necessity, so far they have not been used.

Twin-screw propulsion for mail steamers may be said to date from 1889, the year of the *Teutonic*. Since then the *Orel*, *Scot*, *Ophir*, *La Touraine*, have been built and have demonstrated the advantages of twin-screw propulsion. When the *Teutonic* appeared, the method of carrying the propeller shafts, and placing one propeller slightly in advance of the other, were hailed as something quite new and extraordinary. The method of carrying twin-screws by means of **A** brackets

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is one that has come down to us from the remote days of screw propulsion. Mechanically the arrangement is atrocious. It is all very well to hang a railway train at the end of a cantilever, as is done in the Forth Bridge, but even a cantilever is but an expedient and is never adopted where direct support and rigidity can be obtained.

It strikes most people as rather imprudent to place a propeller weighing some 30 tons at the end of a shaft transmitting some 4,000 or 6,000 horse-power, when it is out of sight and wholly inaccessible. For war purposes, what could be more convenient for fouling the screws and rudder than the two brackets and their lengths of shafting. The evils of the system were abundantly demonstrated by the *City of Paris* and H.M.S. *Anson*. Had the shafting been carried in manner adopted in the *Teutonic* the injury to the stern-gland and its consequence, the loss of support to the shaft, would have been impossible.

The method of carrying the propeller shafting in such vessels as the *Majestic*, *Teutonic*, *Nomadic*, *Naronic*, *Empress of India*, *Empress of China*, and *Empress of Japan*, and also on the two new Cunard steamers, is from every point of view superior to the usual one of **A** brackets. In the former the stern frame is a steel casting having, where the "swell" for a single propeller shaft would be, a rectangular enlargement with deep recesses on each side, in this is accurately fitted a massive transverse piece, the two extremities of which are enlarged and bored out for the reception of the tail-end shafting. This spectacle frame is further secured to the before-mentioned inner stern-post by massive steel bolts. Immediately before the framing on each side the main frames of the hull are curved out, the circle of curvature gradually increasing, till it is lost in the lines of the hull. The plating is worked over this, and thus the two shafts are enclosed in two tubes. By this method access to the stern-gland is as easy as to the saloon. The shafting can be thus under constant observation. Notwithstanding the many advantages of this system, it is still regarded as an "experiment" and as an "innovation," and, therefore, is not adopted by the Admiralty. Many people are under the impression that this method of arranging the shell plating to enclose the shafting originates with the builders of the *Teutonic*. This is not so. This method and overlapping screws are two very old developments of shipbuilding, and, as the facts are not generally known, it may be well to state them.

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It appears that the design for carrying twin-screws without the aid of A brackets originated with a Captain Symonds, who made a communication on the subject to the Transactions of the Institution of Naval Architects in 1864. Whether Captain Symonds ever actually designed a vessel on this plan is not known, but in 1865 Messrs. J. & H. Inglis, of Glasgow, fitted the twin-screw steamer *Cosmos* in this manner. The next step seems to have been due to Messrs. Laird, of Birkenhead, who found in twin-screw steamers that there was a great gain in manœuvring power obtained by leaving an aperture in the deadwood similar to that in single screw steamers. The next step was taken by Messrs. Rankin and Blackmore, of Greenock, in 1876, who built the twin-screw steamer *Otter* with the aperture in the deadwood, and also with one propeller in advance of and overlapping the other; some 36 steamers were thus built. These improvements were, however, not generally adopted, as they were not necessary for the moderate speed then prevailing. When high speed twin-screw steamers became common the mechanical defects of the fashionable method were very apparent. A brackets were, however, employed in the *City of New York* and *City of Paris*, in the Union Company's *Scot*, and also in the New Orient Company's *Ophir*. In 1885 Messrs Harland and Wolff built the twin-screw steamer *Irene;* this vessel was the first, we believe, to combine these improvements of lapped butts, enclosed propeller shafts, and overlapping screws; she was followed in 1887 by the *Olga*, built by Messrs. Laird, and then by the *Teutonic*. The only advantage of overlapping propellers is that it permits the employment of large diameter screws in a small transverse length, and it also affords the screws better protection. On the other hand, these advantages are obtained at the expense of the efficiency of the propeller, and hence, as the latter quality is the more important in high-powered vessels, overlapping is not likely to become general for such ships. The tendency is now in the direction of small screws and high revolutions, and in many of the modern mail boats a reduction in the disc and blade area has been found advantageous. We are, in fact, approximating in the modern mail boat to the first-class torpedo boat in these particulars. This is also evident if we just consider another part of the stern, viz., the rudder. This venerable instrument has, after many experiments, reverted to its primeval shape. The "barn door" type of rudder forms the usually accepted steering apparatus

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for the majority of ships. For ordinary purposes, and where the speed and length are not great, it is probably the best that could be devised; for long and very fast vessels it is less suitable, and where great manœuvring qualities are desired, as in cruisers, catchers, mail steamers, and cross-channel steamers, the balanced rudder is much preferable. The latter labours under the disadvantage of being of little use when going astern. All the fast cruisers lately built have balanced rudders, while the battle-ships have the "barn doors." Mail boats also use the latter, and hence the very large tactical diameter of these vessels, a feature which renders many of them of very doubtful value for use in war-time, when their safety might consist in speed and mobility. In this respect, the *City of New York* and the *City of Paris* are much more valuable as possible cruisers than any other mail boats simply because they can turn more rapidly; or, in other words, they have a small tactical diameter. Of course, the advantage of a balanced rudder is that the area can be very large and at the same time it requires but little power to turn it. The *City of Paris* can turn a complete circle in about six minutes. Her rudder area is about 250 sq. ft. or about $\frac{1}{8}\frac{1}{0}$th of the immersed longitudinal area.

Much has been said of the machinery of the new mail steamers; why, it is difficult to see. The engines are merely larger than others of a similar design which the Fairfield Company have been so successful with. Many of the best known German Atlantic mail boats have similar engines, built by the same firm. In the construction of these engines there is nothing at all calling for remark, unless we except the splendid workmanship. The arrangement adopted is an extension of the tandem system as introduced by Maudslay in the *Germanic* some 20 years ago, with an intermediate cylinder between the low pressure ones. The machinery of modern mail steamers has not altered very much of late years. The old-fashioned Stevenson link motion, inefficient as it is, is still retained, although there are at least two better valve motions, viz., the "Joy" and the "Morton." The weight of machinery, too, is still as high as ever, and in the new Cunarders it will certainly not be less than 480—500 lbs. per I.H.P. It is difficult to call this "the advance of engineering science."

It is a most difficult task to compare steamships. So long as we are content to say one vessel is faster than another, it is

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easy enough; but to express the relative value of steamship performances it is necessary to take as a basis of comparison the greatest weight moved, the distance moved, the rate of moving, and the cost of moving. To make this comparison of value it is essential that the data should be accurate, but those who want accurate data of steamships will find it easier to reeve a hawser through a sail needle than to obtain really absolute and trustworthy data of cost of steamship propulsion. Shipbuilders and shipowners will cheerfully reveal their family affairs to an anxious seeker after truth; they do not mind being quite open and candid in most things, but directly one "wants to know" the relation between speed, power, and coal consumption, one is met with, to put it mildly, an expedient perversion of facts. The information is however to be had, and we therefore publish the following table, which shows the degree of merit of some well-known mail steamers. This figure of merit or co-efficient of performance is:

$$\frac{\sqrt[3]{D^2} \times V^3}{K}$$

Where D is displacement,
V speed,
K fuel consumption.

Steamer.	Co-efficient of Performance.	Steamer.	Co-efficient of Performance.
Oceanic	14,900	*Teutonic* and *Majestic* ...	15,860
Arizona	11,300	*Columbia* ...	13,730
Orient	11,240	*Empress of India*, *Empress of China*, *Empress of Japan*	13,230
Umbria and *Etruria* ...	9,467	*Scot*	13,000
City of Paris and *City of New York*	15,270	*Ophir*	12,760

It will be seen that no great increase in efficiency has taken place since the day of the *Oceanic*, and it is difficult to see why we should metaphorically pat our shipbuilders on the back for their laborious progress. When we consider, too, that the co-efficient of performance for a first-class modern tramp is as high as 22,000, the comparative inefficiency of the modern mail steamer is very apparent.

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Rolling and vibration are as ever marked features of the modern mail boat. Professor Biles dealt with the former in the *City of Paris* and *City of New York* by the balance chamber method, which really is the only one suitable for large vessels. Providing that the chamber is made large enough and strong enough, rolling can be very sensibly diminished. For the efficiency of this method much depends upon the statical stability of the ship, and as in merchant steamers, this is a very varying quality, the balance chamber would have to be of large dimensions. The use of the balance chamber has, we believe, been discontinued in the vessels mentioned. The other method of checking rolling, viz., that due to Mr. Thorneycroft, is so far applicable to only small craft; it is to be hoped that the charmingly beautiful apparatus he has devised will be modified so as to permit its use in large vessels. Bilge keels might be more generally adopted than they are for the purpose of diminishing the arc of oscillation; there is, however, a deal of stupid prejudice against their use. In those cases where they have been fitted and have been made sufficiently deep, their influence has been very beneficial. In cattle steamers, indeed, their employment is necessary. As regards vibration, this is caused by the operation of the same law which produces rolling; in other words, the oscillations of one body set up oscillations or vibrations in another, and when these synchronise we have in the one case those deep and heavy rolls, and in the other that rapid vibration which shakes all the crockery in the ship. Till Mr. A. F. Yarrow pointed out the solution of the difficulty, the favourite theory was that vibration resulted from structural weakness, and hence material was often piled up in places where it did no good. Sometimes this additional material produced an alteration in the "period" of the hull, and synchronism occurred less frequently; it was then said that the extra strength produced the good result. Among the worst offenders as regards vibration are the large fast Atlantic liners, in which strength is, if anything, excessive. Whether it would be possible to introduce a system of bob-weights to the massive machinery of the *Teutonic* is a question that we need not now discuss. But in all fast vessels vibration is not only a serious discomfort but a possible source of danger, as the continuous vibration of the molecules in steel, &c., must produce fatigue, and ultimately rupture. We will briefly consider the mail steamer in another aspect. Before a mail steamer could be employed as an armed cruiser, with some

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reasonable prospect of beating off, say, the *Orel*, she would require considerable modification, something in the nature of a protective-deck would be required, while it would also be necessary to render the lower decks watertight flats; a protective-deck would be absolutely necessary in the vicinity of the engines and boilers, and this would have to be supplemented by *glacis* work surrounding the cylinder tops. Coal protection is a much vaunted substitute for armour; but it would most likely happen that just when it was required for protection it would have been consumed as fuel. The steering gear, too, would have to be placed below the water-line. The usual practice is to place it up as high as possible. Why, it is difficult to say. The *City of Paris* and her sister expose neither the rudder nor the steering gear. Both are below the water-line. So far as we are aware, this excellent system has not been adopted in any other mail steamers. It will be seen that although the list of vessels which, as the newspapers tell us, "can if necessary be utilised as armed cruisers" is a rather large one, the actual number of British mail steamers that remotely approximate to the *Orel*, or "No. 12," can be counted on the fingers of one hand. Putting the matter in its sober truth, we may say that our mail steamers would make, in war-time, excellent transports, while the smaller class, such as the *Gazelle*, *Lydia*, *Duke of Clarence*, &c., would make excellent dispatch boats and possibly some might be useful "catchers." This view is, we are aware, not in consonance with that held by many authorities, but it is the opinion of a good many naval men, who are not standing for a constituency, and who, therefore, are not called upon to utter "soft nothings about the glorious Mercantile Marine of this great country." France, Italy, Russia, and Spain possess several mail steamers of purely military design. They are, of course, but indifferent merchant ships, but the carriage of passengers and merchandise is only regarded as an incident in their *rôle*. We design our mail boats purely for fast passenger traffic. We say this knowing as well as anyone the additions "made to satisfy Admiralty requirements" that many of them have. Except for the purposes we have named, the ordinary mail steamer has but a limited value for naval purposes. It would, of course, be quite possible to design a mail vessel possessing the best features of the *Teutonic* and the defensive and offensive qualities of the *Edgar*. Such a vessel would be a modified *Piemonte*. She

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would, however, lose her Mercantile character, and be, *de facto*, a warship. Before we can utilise our merchant ships for purposes of offence or defence, we must withdraw from that fatal measure, the Treaty of Paris.

Liverpool. GEO. HERBERT LITTLE.

TYPES OF IRON AND STEEL CARGO VESSELS.

IN the course of an able address at the opening of the winter session of the North-East Coast Institution of Engineers and Shipbuilders, the President, Mr. Robert Thomson, of Sunderland, alluded to the various types of cargo steamers, and stated that two members of his own staff were preparing a paper on the "Types and Proportions of Mercantile Steamers in Relation to Cost, Carrying Capacity and Speed." Papers of this character, based as they are upon figures obtained in actual practice, are of very great value, and in the past history of the North-East Coast Institution much good work has been done in this direction. At the same time, after all has been said and done, the fact remains that there is no generally accepted type of cargo steamer, but that while new developments are frequently appearing, old forms, to a large extent, hold their own, and it would appear to be still a matter of opinion whether a three-decker, a spar-decker, a well-decker, or a partial awning-decker is the more profitable vessel. An obvious retort to the question, "What is the most profitable type of cargo steamer?" is, "Tell me what trade she is for, and an answer can be given;" but vessels built for special trades are after all a small proportion of the total, and what the shipowner wants to know is what is the type which is best for a *tramp*.

We do not pretend to be able to answer this question; but we think it may be useful to state some of the conditions of the problem, and to describe some of the efforts which have been made to solve it. Now there are two factors in the question which have always been to a large extent out of the shipbuilders' control, and to these a third has been recently added. Lloyd's rules are subject to change and development, but still they fix to a large extent the weight of material in the ship, and consequently its cost, and thus furnish the first and

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most important consideration. The register tonnage, and still more the Suez Canal tonnage, which is dependent on it, measures much of the current expenditure, and must be taken into consideration as well. To these is now added the question of the compulsory load-line, which fixes the vessel's earnings. There are thus arbitrary conditions affecting the first cost, the working expenses and the current takings of the vessel, and the designer of the modern cargo steamer has to take all these into consideration, as well as the natural elements of the question, and then the problem has to be solved as to which is on the whole the most profitable type.

One may clear the ground a little by considering a few ways in which the arbitrary elements do not affect the question so much as is sometimes supposed. Thus very much has been said about the unreasonableness of Lloyd's scantlings being based upon four dimensions only, and thus taking but little account of the form of the ship. It is frequently urged that the displacement is the true measure of the strains upon a ship, and that consequently scantlings should be based upon displacement. In the early history of Lloyd's surveys of iron ships, the scantlings were based upon the gross register tonnage, which in those days probably varied nearly as the load displacement. There was this practical difficulty, that a ship being designed, so as to come, let us say, just under 2,000 tons, when finished and measured was found to be just over 2,000, and so instead of being classed for 12 years, the highest class at one period, could only obtain a nine years class. It was accordingly arranged that the scantlings should be regulated by a few dimensions, which could be fixed in the original design and which it was easy to secure in practice. Thus the well-known numbers were adopted; the number for determining the transverse part of the structure being the sum of the depth from top of beam to top of keel, of half the extreme breadth measured to the outside of the frames and of the half girth of the midship section. All these dimensions are taken amidships. The longitudinal parts of the structure are determined by a number obtained by multiplying the frame number by the length of the ship. There are further considerations of extreme proportions which are settled chiefly by the number of depths in the length, but to some extent by the number of breadths in the length also. All this it will be noticed leaves out of the question the form of the ship at the ends. Thus it has been said that a vessel whose co-efficient of fineness is ·7

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may be required by Lloyd's rules to have as heavy scantlings as if her co-efficient were ·8, that is, a vessel of 3,500 tons displacement requires as thick plating as one of 4,000 tons displacement. In early scientific works regarding the strength of ships, it was considered that the longitudinal strain upon the material varied with the displacement and length, but more recent investigations have considerably modified this view of the question, and at the last meetings of the Institution of Naval Architects, Mr. T. C. Read, of the scientific staff of Lloyd's, put the whole question somewhat as follows:— Modern cargo steamers are all vessels of full form, while vessels of fine form are designed for passenger service. *Lloyd's Register* classes about one of the latter to seven or eight of the former. If their rules really exacted larger scantlings than were necessary from fine ships, it would follow that the cases of failure from deficient strength of fine ships would be very rare in the experience of Lloyd's. The fact is, that fine vessels very frequently fail. Consequently, if theory tells us that fine ships are unnecessarily strong, the fact is the contrary. The truth is, however, that it is only by a partial and imperfect consideration of the case, that the supposed scientific result is obtained that fine ships are less severely strained at sea than full ships of the same dimensions.

In comparing fine ships with full ships for various purposes it is often forgotten that fineness has two distinct elements. A ship may have a small co-efficient of fineness because she has fine ends as compared with her form amidships, or because she has good rise of floor and an easy bilge. In the former case, the fine vessel is in all probability as severely strained at sea as is a full vessel of the same principal dimensions. The same cannot, however, be said when the fineness is due to rise of floor and well-formed bilge. Steamers and sailing-ships built twenty to thirty years ago had good rise of floor, and a well-rounded midship section, and they derived much strength from their form. Such vessels retained their shape with but very small demands upon the transverse parts of the structure, and from experience gained with them it has often been somewhat hastily concluded that transverse strength in iron ships is of little consequence. It is true that in the early iron ships its importance was much exaggerated.

For instance, looking to Lloyd's rules for 1858, we find that plating and frames were both of considerably larger scantlings than in the current rules, but in a vessel where under the present

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rules the spacing of the frames would be 24 inches, in the rules of 1858 it would be 18 inches. In the rules of ten years later we find this provision relaxed, and the frame spacing of large ships allowed to be 24 inches on condition that the frames were double from the keel to the turn of the bilge. Later on the condition was not exacted and the frame spacing became 24 inches, increased in very large ships to 25 and 26 inches. Thus, with the large demand upon the framing caused in ships of the present day by the flat floor and sharp bilge which give us large areas of plating in a surface approaching a plane, and thus deriving no strength from its form, there is less material to meet the increased demand. There is a further consideration in the substitution of steel for iron. It is true that as regards its ultimate tensile strength, steel is so much better than iron as to justify a reduction of twenty per cent. in the scantlings. But the new material is less rigid than the old, and hence the plates can only safely be reduced on condition that they be adequately stiffened. It is for this reason that the President of the North-East Coast Institution says the actual gain on steel now is not twenty per cent., but is more like seven per cent.

Now, while one may desire that ships should be built of a form conducing to strength, it must also be remembered that the form of the midship section is to a large extent forced on the shipbuilder by other considerations. Ships of all types are restricted as to draught by commercial considerations. Whatever the carrying capacity of the vessel, she has a larger range of employment if her draught is kept small. Her breadth is limited by the consideration that if it is excessive she will, with cargoes of medium density, be uneasy in a seaway. The ways of increasing carrying capacity are thus to increase the length, and to have full lines, and it is owing to this that we have the sharp turn at the bilge as well as the full ends of the modern cargo steamer.

From these considerations it would follow that Lloyd's rules might be advantageously altered by taking more into account the form of the midship section. Thus, if the depth were omitted from the frame number, greater importance would attach to the half girth, and there would be more inducement to make it small by giving a well-formed bilge. Further, a ship gains in strength by increase of depth, and it is consequently unfair to ask for larger scantling on that account as much as for increase of breadth.

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The question of tonnage does largely affect the design of steamers, but somewhat less so than it did a few years ago. Previous to 1889 a special construction of double-bottom was favoured by the British tonnage law, but such is not now the case. The tonnage law prescribed that the surface to which the measurements shall be taken is the ceiling on the floors of the ship. Now, in the form of double-bottom for water-ballast, known as the MacIntyre bottom, the plating forming the upper surface of the water-ballast tank is attached to fore-and-aft girders which rest upon the floors of the ship. As a consequence of this, about half the contents of the water-ballast tank was included in the register tonnage of the ship. A new system of construction, however, was introduced where the inner plating of the double-bottom rested upon longitudinal frames associated with deep bracket floors, and, consequently, by the words of the law, the measurements were taken to the upper surface of the double-bottom. The *cellular* system, as the latter was called, was thus favoured by the tonnage law. This state of things lasted until 1889 when, in a Tonnage Act, a clause was introduced to exempt from measurement double-bottoms for water ballast, however constructed. The Parliament of Great Britain, however, can only legislate for British tonnage, and the old anomaly still obtains in respect of the tonnage upon which ships pay the Suez Canal dues. It is somewhat singular that shipowners do not endeavour to obtain an alteration of the Suez Canal tonnage rules of a similar character to that which has been made in respect of English tonnage.

The tonnage laws, however, do still hamper the British shipbuilder very considerably. It may be desired to give a vessel a large clear side in relation to her dead-weight capacity, but this can only be done subject to the condition that some profitable employment shall be found for all the space in the ship. Thus, in the modern well-decker, as she is called, there is a bridge-house joining a raised quarter-deck, extending over about three-fourths of the vessel's length. At her fore-end there is a forecastle extending over about one-eighth of her length, and then between that and the bridge-house there is a well. The forecastle has no bulkhead at its after-end, and consequently it and the well are exempt from tonnage measurement. Now, the vessel would be much better in some respects if the forecastle-deck were extended to meet the bridge, but she would have her tonnage much increased. When these vessels have a very strong bridge-house they are, if the forecastle and

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bridge-house be continuous, allowed by the load-line rules to load some few inches deeper than an awning-decked ship, and thus the "partial awning-decker," as she is called, becomes a possible type of ship, but there can be little doubt that all well-deckers would be more seaworthy with the well filled in, and the tonnage laws practically prevent the filling in of the well in many cases.

To alter the whole system of tonnage measurement would be a difficult task; but if any system were adopted which would set shipbuilders free of the consideration of tonnage, one great obstacle to progress in ship construction would be removed. To charge tonnage dues upon dead-weight carried would be to practically exempt from taxation passenger steamers of the class which will be very common in the future, that is, exclusively passenger carriers. But a system of tonnage depending upon the gross displacement to the marked load-line would take in more than the mere dead-weight cargo capacity of the ship, and would at the same time free the designer from the present harassing restrictions.

Coming now to the consideration of the various types of cargo steamers, we will first refer to a type which is practically obsolete, but which serves as a starting-point for a description of other vessels. This is the steamer with two decks, or rather with two tiers of beams, and with small deck erections. In the early days of iron shipbuilding it was quite the exception for vessels to have more than two decks, and in those which had more, the upper-deck was nearly always of light construction. This state of things left its mark on the tonnage laws where the term spar-deck is used generally for a third deck. It is also assumed as a general condition in Lloyd's early rules. Thus we read:—"In vessels with three decks, namely, upper (or spar), middle, and lower deck," &c. In fact, for years after the "three-deck steamer" was made a distinct class from the "spar-deck steamer," it was still the case that the upper-deck stringers were lighter than those on the main-deck. The three-deck steamer is now, however, built so that her upper-deck is the strongest deck, and the upper strake of side plating always the thickest plate, and thus she, as regards longitudinal strength, has her material disposed to the best advantage. In the "two-deck vessel" the number regulating the transverse scantlings is obtained by the sum of the half breadth of the vessel of the depth to the upper-deck, and of the half girth of the midship section measured to the

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upper deck. In the "three-deck steamer" the measurements are taken to the same points, but seven feet is deducted from their sum. In the spar-deck steamer the depth and half girth are taken to the main-deck only; that is, the second deck down. In each case the frame number is multiplied by the length to obtain the plating number.

Thus, a three-deck steamer is, as regards her dimensions of lighter scantling than a two-deck steamer, and a spar-deck steamer lighter than both. To obtain this advantage, however, the three-deck and spar-deck steamers have the disadvantage of an additional deck or tier of beams, and are compelled to have two decks laid. Now, one of the points to which very great importance is attached by the shipowner of the present day, is to have as clear a hold as possible. The extra deck is a great disadvantage, but there is no way out of it by Lloyd's rules if the advantage of lighter scantlings given by the smaller numbers is to be kept, but a way has been found of getting rid of the third tier of beams by the introduction of the system of web frames. The ordinary frames of the ship are spaced, say 24 inches; but at intervals, varying with the size of the ship, from eight to four ordinary frame spaces, there is introduced a much stronger frame built up of plates and angle irons, and called a web frame. The web frame is from 14 to 18 in. deep, and thus projects considerably inside the ordinary frames; and while it is much less objectionable than a tier of beams, it still does itself interfere with the stowage of the hold. At the present time another arrangement is coming into use by which the loss of transverse strength, caused by the omission of the tier of beams, is made up in a way which causes less inconvenience than the web frame. This is by a general increase of the size and strength of all the framing of the ship. In an ordinary ship, the frame angle is considerably larger than the reverse frame angle, and they are connected in such a way that the total breadth of the two is that of the frame angle. The increase of size in the new type is obtained by making the reverse frame angle of about the same size as the frame angle, and so connecting them that the former projects beyond the latter. Thus considerably more strength is obtained, as much, in fact, as is afforded by the web frames. Ships constructed with all the frames enlarged in place of web frames at intervals, have the further advantage that the breadths of the tonnage measurement are decreased by two or three inches, and thus in two ships

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built of the same size externally, the tonnage of that constructed with enlarged frames would be less than of that having web frames. Of late years, steel of Z form or of what is known X as "channel" form, has often been used in place of the ordinary frame and reverse frame, the result being a saving of weight and also of the work of riveting the frame and reversed frame together. If the enlarged frame is much used, it will obviously be a considerable advantage to substitute for it a steel of Z or channel section.

The various types of well-decker are all based upon attempts to retain to some extent the clear hold of the two-deck ship in vessels of the size of a three-deck ship. In the part of the well-decker, where there is a raised quarter-deck, there is a deep hold unhampered by a lower deck. At first, the raised quarter-deck was adopted in order that the vessel could take a good portion of cargo in the after-hold, and thus be in better trim than she would be with an after-hold of the same depth as the fore-hold, while its capacity was diminished by the shaft-trunk, etc. This advantage, as regards strength, is retained with a bridge-house of moderate dimensions, but when the bridge-house is greatly increased, as in the modern well-decker, the practical conditions approach more and more to those obtaining in a three-deck ship, but there is still the gain caused by the small tonnage as compared with dead-weight capacity. Finally, in the "partial awning-deck steamer," we have a well filled in; the upper part of the vessel amidships being however stronger than the corresponding part of an awning-deck ship, and the vessel is consequently allowed to load deeper than an awning-deck ship. All the advantage of being able to trim well when full is surrendered. The disadvantage caused by the break off of the upper-deck, where the raised quarter-deck begins, is felt more or less in all ships which have raised quarter-decks, but it is felt most of all in the partial awning-decker because of her deeper loading. It is difficult to understand why ships of such perverse type have come into existence, and yet they do exist, and are in much favour at present, and therefore we must suppose they are found by their owners to be profitable.

Coming again to the spar-deck steamer, as compared with the three-decker, we find them both subject to the same conditions as regards their holds; but for her cost and displacement, the spar-decker has more space, and with some cargoes, space is still an important consideration. A few years

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ago, it was often said that the days of measurement cargoes were nearly over, bale goods being pressed into such a small space that soon we should have only dead-weight cargoes. More recently the dead-meat trade has brought into existence a class of vessels where space is of more value than displacement.

The spar-decker has at present grave faults in her design, caused by the condition of Lloyd's rules—the heaviest sheer-strake and stringer are at the middle deck, and that is the wrong place most certainly; but we still think that the spar-decker may be improved without improving it out of existence, and may still continue to be a useful type of ship. The ideal spar-decker would be a vessel of lighter construction than the three-decker, and consequently loading less deeply but with the material as advantageously placed in the one ship as in the other. In fact, with a judicious alteration of the rules of construction, a vessel might be obtained in which space and dead-weight capacity should bear the same relation as in the existing spar-decker, but in which equal strength could be secured with less cost and weight of structure.

The ordinary three-deck steamer has usually a short forecastle and short poop, and a bridge-house covering the engines and boilers; in fact, in a vessel built chiefly with a view to dead-weight capacity this is the best arrangement. If little or no cargo is carried in the deck erections they set free for cargo purposes the whole of the hold; and for vessels loading deeply the highest parts of the structure should obviously be the ends and the middle, in order that the ends should not be submerged when the vessel is in the hollow of the wave, nor the middle when she is on its crest.

It remains to briefly notice the awning-decker. This vessel is, as regards her structure up to the main-deck, at least, equal to a spar-decker of the same dimensions. In some cases Lloyd's rules require her to have even more material up to the main-deck than a spar-decker would have. Above the main-deck she is of light construction, the side plating in that part being very thin, as is also the stringer at the upper-deck. While in a three-decker or spar-decker all the frames and the alternate reverse frames run up to the upper-deck, in an awning-decker all the frames, but none of the reverse frames extend to the awning-deck. The awning-deck ship originated, as its name implies, in a simple awning of very light construction, which was built upon vessels intended for passenger ships in tropical climates. At first only alternate

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frames extended to the upper-deck, but the strength has been increased with a view to making the superstructure seaworthy in itself, although its contribution to the general strength of the ship is comparatively small.

For passenger ships of moderate size, the awning-decker is still an advantageous type of construction. A large amount of space is obtained, and ports of good size can be cut without causing much difficulty as regards compensation for the strength cut away. With large ocean passenger ships, the question of longitudinal strength becomes of so much importance as to render undesirable the awning-deck type with its unprofitable distribution of material. Strange to say, a large sailing-ship is now building on the Clyde with an awning-deck. It is difficult to understand how any advantage obtained can compensate for the large register tonnage as compared with dead-weight capacity which will result from the adoption of this type of construction in a sailing-ship.

NAVAL ARCHITECT.

SIDE LIGHTS AND THEIR SCREENS.

THE Regulations for Preventing Collisions at Sea prescribe [Art. 3 (*d.*)] that the Green and Red side lights of vessels shall be fitted with inboard screens projecting at least 3 ft. forward of the light, *so as to prevent these lights being seen across the bow.*

Article 15, and the explanatory paragraphs following it, clearly indicate that these screens shall be fitted so that the two lights shall be seen at the same time by a vessel right ahead (on a prolongation of the fore and aft midship line). The only possible arrangement by which side lights could fulfil both these conditions would be by placing them forward of the foremast near the midship line of the ship with long screens back to back. There are many manifest objections to such an arrangement, especially for sailing-vessels, and it seems generally admitted that the proper place for side lights is on or near the ship's rail, though opinions seem to vary as to the distance they should be placed abaft the stem. My own opinion is that they should be so placed that a vertical line from the masthead

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light and a horizontal line from the side light form at their intersection two sides of an isosceles triangle, as in that position they indicate much more clearly to the officer in charge of another vessel the angle at which the vessel carrying them is crossing her path, so much so that he can see at once any material alteration in her course.

Assuming, then, that the side lights are carried on the ship's rail, they will be separated from one another by a space approximating to the beam of the ship, and if screened according to Article 3, would theoretically leave a dark lane ahead of the ship of about the same breadth, in which neither light would be seen, and outside which only one would be visible. I understand that Board of Trade experiments confirm this theoretical view, and my own observations support it.

Under these circumstances an approaching vessel which by day would have her masts in line, would by night show neither of her side lights, and the vessel she is meeting being similarly fitted, the whole object of Article 15 is defeated, and the collision of vessels meeting end on at night courted instead of avoided.

The only way out of the difficulty is that, I think, adopted by the Board of Trade of taking a broad view of Article 3. While it says that each side light shall be fitted with a screen so as not to be seen across the bow, it also provides that each side light shall show from right ahead to two points abaft the beam on its own side. "Right ahead" from a point, say from 10 to 25 ft. either side of the midship line, is an elastic term, and a light that will show from such a point right ahead of the stem must converge towards the fore and aft midship line of the ship. Bearing this in mind, and looking at the Regulations as a whole, it appears clear that unless we are to stultify Article 15 we must slightly modify the strict mathematical interpretation of Article 3 (*d.*), and fit the inboard screens at such an angle that the two side lights shall be seen ahead of the ship by an approaching vessel in time to prevent a collision.

Admitting this, the next question to decide is, what is the minimum angle that will fulfil this condition, for apart from the legal aspect of the case, on which I do not wish to express too strong an opinion, but which must place a limit beyond which will be a contravention of Article 3, I think all practical seamen are agreed that it ought to be as small as possible.

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With a view of testing the relative advantages and efficiency of different angles for the crossing of the lights, I have calculated the annexed table for five vessels that I think will be found fairly representative both in size and class. The first two are large modern steamers identical in every respect except that in the second the side lights are carried 90 ft. farther aft than in the first. No. 3 is a sailing-ship of the dimensions of a celebrated Aberdeen clipper. Nos. 4 and 5 are schooners carrying their lights as small craft generally do, well aft. I have expressed the distance of the crossing point of the lights from the stem (or boom end) in terms of the extreme length of the vessel (stem to taffrail in a steamer, jibboom end to taffrail in a sailing-vessel), as I consider this the most satisfactory unit to adopt in reference to the turning capacity of the vessel to avoid a collision, though we all know that this capacity varies largely in vessels of the same size. Bearing in mind that the object of the lights converging on the bow is to show another vessel that you are coming stem on in time for her to take steps to avoid you if it is her place to do so, a reference to the last column of the table will, I think, be sufficient to establish the fact that in moderately clear weather an angle of two degrees will be ample to effect this purpose. If it is a large steamer, as No. 1 or 2 of the table, that is approaching, her lights will show anywhere beyond about her own length past her stem, before which time the other vessel ought to have acted if it is her place to do so.

In the sailing ship and the longer of the two schooners their lights cross at about one and a-half times their own length beyond their boom ends, which in my opinion ought to suffice. In the shorter of the two schooners, while her lights cross at little over two lengths ahead, they still do so at only 257 ft. from their source, or at 182 ft. from her jibboom end.

In navigating amongst a crowd of shipping or in narrow waters, in even moderately clear weather, there would be a distinct advantage in keeping the angle as small as two degrees; for instance, going down Channel with two vessels approaching, one on either bow (and perhaps several others crossing), a steamer might pass with confidence between them if she could not see their farther lights across their bows, instead of having to port and cross the bow of the one to starboard, which may perhaps bring another vessel's lights in a similar position, and

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having ported for her, a third vessel. Again, coming up one of the narrow reaches of the Thames, a steamer should keep on the northern side of the navigable channel. Suppose in this position she sees the lights of a steamer approaching on her port bow. With the lights screened finely she would see only the port side light, and pass her with confidence. With the other vessel's starboard light showing across her bow she would appear to be coming end on, the steamer going up would port unnecessarily to clear her, and get perhaps dangerously near the northern side of the channel.

From this and every other point of view that I can conceive, except in the case of thick weather partially obscuring the lights, the finer they are screened the better, provided there is no dark lane ahead of the ship outside the distance at which the lights ought to be visible in time to avoid collision.

The only advantage to be obtained by increasing the angle, is that in thick weather the two lights will be seen inside the distances in the last columns of the table; when outside those distances they would be obscured by fog, and it is, I presume, assumed by the advocates of the larger angles that this is advisable or necessary to prevent collisions in foggy weather. My answer to this view is, that while it is correct theoretically, and perhaps at first sight appears unanswerable, the advantages are more apparent than real, and are immeasurably outweighed by the disadvantages.

To begin with, when lights are not visible at the distances in the last columns of my table, it is time that a steamer is slowed right down and prepared to go astern if necessary, and a sailing ship should be under very easy and handy canvas. Both vessels should be trusting more to fog-signals than to seeing lights. If two steamers get to such close quarters end on as half their own length before seeing one another's lights, the best thing they can do is go "Full speed astern," and the use of the second light in avoiding a collision at such close quarters will be very problematical indeed. So much for the one advantage of increasing the angle, the disadvantages I have enlarged on already; but if the reader wishes to test them for himself, let him cut out of a piece of paper a few of the annexed diagrams representing an arc of four degrees on either side of the course up to a distance of two miles, drawn to scale of the Admiralty Sheet of the Thames, No. 1,185, and placing them on that chart to represent vessels' lights, as they would

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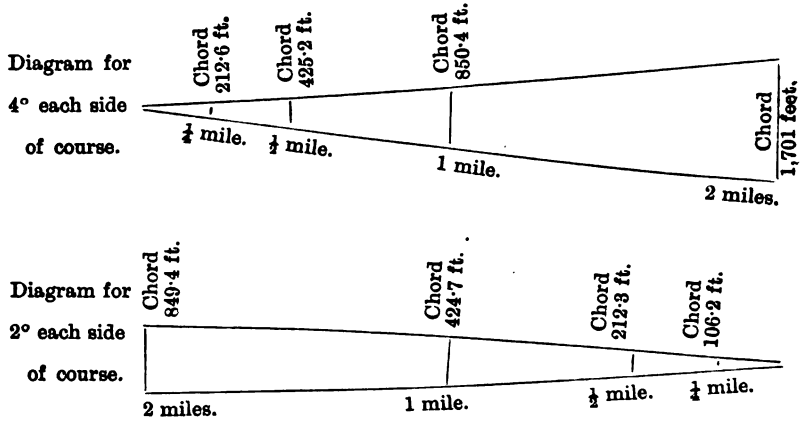
be coming down the river he will see how bewildering and confusing they will appear to a vessel going up, especially when we remember the power of modern side lights, most of which, in the better class of vessels, at any rate, much more than



comply with the bare requirements, and show very brightly at two miles, and sometimes a good deal farther. If some of the same diagrams cut out to scale are placed on a large scale chart of the Channel to represent the lights of a fleet of vessels coming up off one of the salient points that vessels hug, as Dungeness, it will be at once seen how embarrassing they will appear to a vessel bound down who may find it very difficult to manœuvre any where near her course without having at least one vessel apparently coming at her. Who will undertake to say that this may not have been the cause of many of the cases of running ashore, and collisions in the past, especially if, as I believe, the Board of Trade authorities contend the average angle to which lights have been heretofore fitted by their surveyors exceeds four degrees. If diagrams of a similar nature, but with the angle only two degrees each side of the course, be laid on the chart, it will be seen that they are not nearly so embarrassing to the navigator going the other way. I have not taken into account the effect of inaccuracies in the steering, because that will affect equally the large and the small angles, but it should by no means be forgotten that they will cause the red and green lights to be seen more than the two degrees or four degrees (as the case may be) across the

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course of the vessel. While I contend that if there is to be a fixed uniform angle for the lights of all ships, that angle ought not to exceed two degrees, I consider the system a fallacious one, or at least, capable of improvement. A glance at the table will show that a uniform angle does not produce uniform results in different classes of ships, or even in two sister ships with their side lights placed differently. The typical vessels I have taken have their lights fitted in a way that was all but universal, till a few years ago, when the lighthouse system was introduced, and has since found favour with a number of builders and owners. I do not approve of lighthouses, because their sole *raison d'être* in a steamship comes about by placing the side lights so far forward that the fore and aft distance between either of them and the masthead light gives no indication of the angle at which she is crossing the path of another vessel. Still they are often fitted of late years both in sailing ships and steamers. I have no measurements by me of the positions of lighthouses actually fitted in ships, and so did not introduce this type of vessel into my table, but it is quite possible to build the lighthouses in such a position that their proximity to the centre line will more than counteract the effect of their being so far forward, as far as the crossing point of the lights from the stem is concerned, and make this distance only ·25 or ·3 of the length of the ship. The uniformity to be aimed at is, I think, in making the distance of the crossing point of the lights from the stem or jibboom end proportional to the length of the vessel, say from 1 to 1½ lengths, limiting the angle to three degrees, which should in no case be exceeded, so as not to embarrass the navigation of other vessels in narrow waters. It may be objected that this necessitates a different angle for each vessel, but it is a very simple matter to calculate it by tables, which every man who has passed the lowest grade Board of Trade examinations understands the use of. To the distance the lights are to cross ahead of the ship add the fore and aft distance they are abaft the stem. This divided by half the distance between the lights is the cotangent of the required angle, or it may be done experimentally wherever the required distance can be measured ahead of the ship by cutting away the chocks till the lights are just visible from that point. This latter method must necessarily be correct and free from any possible errors of calculation or the error that may be introduced by the non-parallelism of the screens with the keel. After being placed by accurate

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measurements, I have known them slightly displaced in fastening down. At sea, or even in port, it is easy to calculate the angle the light makes with the screen by the shadow of the chock thrown on the horizontal screen the lamp stands on. I have calculated the angle in this way and found it agree within three or four minutes of that obtained afterwards in port by measuring with a lead-line the distance ahead of the stem at which the lights crossed. The Board of Trade recommend light-towers, and I believe side lights generally, to be placed as far forward as practicable. While I admit there are advantages in having them well forward, I have shown very strong reasons against such an arrangement—reasons which I think will be admitted by the great body of captains and officers, Channel and Thames pilots who have had to handle vessels amongst a crowd of shipping. Those responsible for the safety of their ships should remember that side lights are intended to prevent collisions between crossing as well as meeting vessels, and that their being placed right forward in a long vessel may lead to her being rammed on the quarter in a much more vulnerable place than the bow. I do not wish to lay too much stress on this, as it is not a case that is very likely to happen, as there are generally lights about the deck, and there ought to be a stern light, to say nothing of fog-signals, but it is quite possible for a steamer crossing at an angle of six points to be a trifle outside the aftermost ray of side light when the fog would otherwise just allow it to be seen. Then the slower you are going and the greater the speed of the stranger the greater will be the danger; which would seem to strengthen the views of the American captains, who argued that it was safer to go full speed in a fog, because you got quicker through it, and consequently had less time to get into collision. They never took into account the safety of the becalmed, or all but becalmed, sailing vessels in their track, unable to put on speed to get out of their way, even if the screech of the syren heralded their approach. Such arguments will not hold water for a moment except with those whose wish is father to the thought. Two modern ocean greyhounds approaching one another at the rate of 30 or 40 miles an hour would hardly have time to hear one another's fog-signals before a collision between them might occur. At this speed they would cover a space representing one of their lengths in eight to twelve seconds, out of which there is not much time left to look for a second side light.

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CLASS AND DIMENSIONS OF VESSEL.	distance between the lights.	Extreme length stem or boom end to taffrail.	Side lights abaft stem or knighthead and jibboom end.	Screened to 4°		Screened to 8°		Screened to 2°	
				Perp. distance from lights to crossing point.	Distance stem or boom end to crossing point in terms of extreme length.	Perp. distance from lights to crossing point.	Distance stem or boom end to crossing point in terms of extreme length.	Perp. distance from lights to crossing point.	Stem or boom end to crossing point in terms of extreme length of ship taken as unity.
No. 1. Steamer— Length, 485 feet Breadth, 48·2 „	beam but	485 ft.	105 ft.	345 ft.	·5	460 ft.	·78	690 ft.	1·2
No. 2. Steamer— Length, 485 feet Breadth, 48·2 „	the extreme	485 ft.	195 ft.	345 ft.	·3	460 ft.	·55	690 ft.	1
No. 3. Sailing Ship— Length, 216 feet Breadth, 36 „ Bowsprit, 60 „	necessarily	276 ft.	50 ft. 110 ft.	257 ft.	·58	343 ft.	·84	515 ft.	1·47
No. 4. Schooner— Length, 90 feet Breadth, 18 „ Bowsprit, 18 „	is not	108 ft.	74 ft. 92 ft.	129 ft.	·84	172 ft.	·74	257 ft.	1·5
No. 5. Schooner— Length, 76 feet Breadth, 18 „ Bowsprit, 15 „	The breadth	91 ft.	50 ft. 65 ft.	129 ft.	·7	172 ft.	1·18	257 ft.	2·1

J. F. Ruthven,
Com., Orient Steam Navigation Co.'s
R.M.S. *Ophir*.

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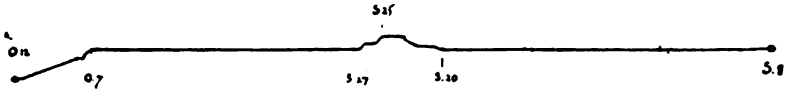
THE TRACK OF COLUMBUS ON HIS FIRST VOYAGE.

AT the present time it may interest many to know the result of a careful plotting of the recorded courses and distances of Columbus upon his famous first voyage, from the Canaries till he lighted upon the Island of Guanahani.

I pinned out on the floor of a room his recorded track, on a scale of five of his leagues (*leguas*) to one inch, and the result shows such a track as is sketched below.

There is no serious difficulty in making such a plotting, for though the courses and distances are but rough and general, they are, at any rate, just sufficient for such a purpose. There is, however, one exception, viz., for October 9th. Here the data are very obscure, and the obscurity introduces an uncertainty in the plotting of the last two or three days of the voyage. It would be tedious to go into particulars, and it may suffice to say that this uncertainty amounts to a matter of 12 of his *leguas* in longitude and 10 in latitude.

Apart also from this particular case of uncertainty, it cannot be pretended that his recorded sailings form any reliable basis upon which to fix, for instance, the exact locality and identity of his landfall, Guanahani. This will be quiet clear from the results yielded by the plotting. The following diagram reproduces the plotted track as accurately as the reduction in size will admit:—



Track of Columbus from Gomera of the Canaries (September 8th, 1492), to Guanahani of the Bahamas (October 12th, 1492), as per recorded courses and distances.

As will be seen, the track as plotted falls into four sections. It shows (1) a direct E. and W. course for nearly half the distance. This portion covers the dates September 8th, when they cleared from the Canaries, to September 19th, or twelve days. Next it shows (2) a divergence, a temporary divergence, to the northward. This divergence from first to last extends over a distance equal to about one-ninth of the entire E.-W. distance, and lasted one week,

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September 20th to 27th. The amount of northing made, as shown by the plot, is about 25 of his *leguas*. The cause of the first divergence, to the northward, is given as varying winds and calms, while that of the second, or southward divergence was a false appearance of land to S.W. The courses and distances here, as recorded, gave as a result the recovery of the original latitude, or as near as may be. This certainly looks intentional, but the journal makes no mention at all of any such intention.

The third section of the track is (3) a second direct E.-W. course. This course was held from September 27th to October 7th, or for ten or eleven days. It covers nearly three-fourths of the remaining distance, or rather more than one-third of the entire E.-W. distance.

Finally, we have (4) a southward divergence (W.S.W.) as far as a point some 25 of his *leguas* east of "Guanahani." This course lasted till October 11th or 12th, say five days, and the E.-W. distance covered by it equals about one-eighth or one-ninth of the whole. This change of course was made, according to the journal, "because great multitudes of birds passed over from the northward to the S.W."

As to the results obtained from thus plotting, the track measured out yields a total departure of: 1st, *minimum*, about 1,065 of his *leguas*; 2nd, *maximum*, about 1,075 ditto. This difference is due to the uncertainty of the *data*, as recorded, for October 9th, as was mentioned above. These departures (counting, as Columbus counted, 4 *millas* to the *legua*, and 70 *millas*, or 17½ *leguas*, to one degree of latitude) equal, in lat. 26-28, about 69° of longitude. But this difference of longitude would place his landfall in the Gulf of Mexico, and is about 11° in excess of the most likely figure.

If Columbus struck the *middle* Bahamas the diff. long. from Gomera would be some 57°-58°; if the north-western, 59°-60°; if the south-eastern, 54°-55°.

Calculating with these figures, this discrepancy shows the *most probable* error of his estimates of distance to be somewhere about *15 per cent. excess.*

The "pilot" of Columbus's own ship appears to have estimated the distances sailed more accurately than did the Admiral himself. Thus, per journal, September 19th, the pilot estimated their departure from the Canaries at 400 *leguas*. For a total diff. long. upon the whole voyage of 58° (the most probable figure) this estimate agrees very well with the plotting,

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which makes that day about four-ninths of total departure (4/9 of 58°, in say lat. 28 = 395 to 400 *leguas*).

Again, on the 1st October C.'s pilot made their departure 578 *leguas*. On the plot it measures out for that day about 589 *leguas*. But Columbus's own estimate as recorded is 707 *leguas*, which is greatly in excess of any probable figure.

The difference of latitude measures about 50 of his *leguas*. If this be corrected by the above-mentioned 15 per cent. excess, we get 42½ *leguas* true, which at 17½ per degree = say 2½°. This deducted from 28° (lat. of Gomera) gives 25½°, not a very likely figure, since that parallel cuts only the northern islands.

The journal, as preserved, contains no references to any astronomical observations worth mentioning, beyond the observation of the pole star for comparing the indications of his compasses.

As to the *courses* recorded, and which are, as a rule, simply "west,"—we know it was Columbus's plan to sail direct westward, but how far he did really so sail is questionable. His general direction must have been something between W. and W. by S., and it is almost certain he made more southing than his courses and distances show. How this is to be accounted for it is interesting to speculate, and speculation is all that is possible. From what Columbus himself says, he considered the island he was discovering to be in the same latitude as the Canaries, but in fact there must have been a difference of, at any rate, four or five degrees. Such *currents* as he experienced, he considered, set generally N.E.; he complains of this specially on September 25th. But it is difficult to see how he can have been set to the *northward*. If he was mistaken, and allowed for such a current when it did not really exist, that would certainly have placed him further south than he calculated; but the journal gives no particulars, but uses only such language as "the course was west as usual." Possibly again when approaching his landfall he may have met with a south-eastward current, such as the charts show skirting the Bahamas.

Most important, perhaps, is the question of the compass variation and its influence. If the variation was westerly over the greater portion of his route, that circumstance would have falsified his reckoning if he did not allow for it. And, as a matter of fact, it appears to have been so with the variation at that date, and also Columbus appears *not* to have allowed for it. One can only say "appears" because the journal is so vague

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and crude. Thus, though Columbus observed the pole star and the indications of his needles, what he says is that he found the needle pointed a full point west in the evening, but in the morning it pointed true; and so he says it was the star that moved, while the needles always pointed true. The winds recorded are usually fair trade-winds, yet according to the authorities the north-east trades in the autumn do not extend further north than 26° to 27°, especially in the more western part of the Atlantic, while, according to his reckoning, Columbus kept uniformly upon the same parallel, say 28°, the latitude of Gomera.

In the first volume of Navarrete's *Coleccion* (1825) the track, or a track, is marked upon one of the maps for this first voyage, and made to terminate at Turk's Island. This island is at the extreme S.E. end of the Bahama chain, and necessitates plotting much longer distances on south-westerly rhumbs than I can find any authority for in the journal. This route, however, appears to have been laid down to suit Navarrete's view that "Guanahani" was Turk's Island, a view which he adopted, because (as he says) Columbus moved always *westward* from island to island till he struck Cuba towards its eastern end, and this he could not have done from, say, Cat Island or Watlings. But it is impossible for any ordinary reader to find that he did move always westward. Navarrete has also another objection to the northern islands, that if Columbus moved "even S.W." from them, he still could not have reached Cuba where he really did, because the latter point would still be more than sixty leagues to windward of where such a S.W. course would have landed him. But this begs the question as to the point at which he did strike Cuba, and, moreover, the journal does not say that he moved "even S.W." Vague and even inconsistent as the journal is, and impossible as it may be to reconcile its geography with the chart, there is the distinct statement that on October 19th he moved S.E. and E. from his third to his fourth island.

The journal of Columbus's voyage, as we have it, is not of a character to be of service for critical purposes; nor, indeed, can we expect that it should be when we remember the primitive condition of navigation in those days, when not only were there no satisfactory angular instruments, but when even the log itself was unknown. But, as it stands, the journal is of surpassing interest, and this interest may justify this attempt to trace the route which the great navigator believed himself to have followed upon this the most momentous voyage in the history of the world.

A. HASTINGS WHITE.

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A GRAPHIC METHOD OF DETERMINING A SHIP'S GEOGRAPHICAL POSITION.

AN interesting and instructive article by Messrs. Favé and De L'Isle recently appeared in No. 734 of the Annales Hydrographiques published by the French Hydrographic Office, and is well worthy of reproduction here for the benefit of navigators who are unable to obtain a copy of the original. We have not deemed it necessary to give a literal translation, but have endeavoured to reduce the space occupied while adhering to the method of the joint authors as closely as possible.

The determination of a ship's position at sea by means of altitudes of the heavenly bodies has given rise to a large number of works setting forth ways of arriving easily and rapidly at the desired result. These laudable endeavours are on the increase owing to the necessity of obtaining a ship's place more frequently than in the good old days. One latitude and two hour angles were deemed sufficient each day for safe navigation; but now, the watch officer on board many a ship must, even on the bridge, take several altitudes and calculate the necessary elements for determining her position. Night observations are much used, but do not afford the same degree of certainty as similar celestial measurements in daytime; so that observations must be increased in order to guard against errors from a poor horizon, or difficulty in reading. Recent publications have introduced new methods and numerous tables to shorten the extra work involved. Although not entirely supplanting former methods, they have, nevertheless, made headway in that direction, and some are in frequent use. The calculation is thus reduced to its simplest form and rapidly made, yet it still seems too long and too complicated to those who have to perform it frequently. The many methods devised for shortening this work go far to prove the immense importance attached to further simplification. Despite royal roads by special tables, or by formulæ, the calculation requires close application, which wearies even in ordinary circumstances, and much more so when the attention is distracted. Several instruments have also been invented for the purpose of obtaining the result mechanically, and graphic methods to reduce the observations which require the handling of formulæ and figures. Graphical methods have an increasing tendency to supplant cumbersome calculations in

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many operations. They ensure greater quickness, less fatigue, and fewer errors. Such advantages are not insignificant, even to an unworried computer, but are of the highest importance to a navigator compelled to work under harassing conditions. Graphical methods may be divided into two classes: geometrical constructions in order to obtain the quantities sought, and diagrams that give the values of the unknown quantities by simple inspection. The latter are becoming very popular, and their advantages have been explained in a work by Mons. Maurice d'Ocagne, which embodies the general principles of this branch of applied mathematics. The system we explain below partakes of both methods. It furnishes, by the aid of a very simple operation effected on the diagram, the necessary data for constructing a Sumner line after the method of Mons. Marcq Saint-Hilaire. We have only to fix successively two points with respect to one of the two systems of rectangular co-ordinates and curves drawn at sufficiently near intervals, and then read their co-ordinates in the other system. There is thus no graphical construction, properly speaking, and the sheet of paper on which the diagram is drawn may suffer slight deformation without sensibly impairing its exactness. Moreover, the diagram may be divided into as many parts as may be wished, and the scale thus made open enough to secure the requisite approximation. The very large number of sheets would, however, cause inconvenience, and render their use irksome. The exact place of a ship at sea cannot be determined within one minute, hence it will be found sufficient if the scale on rectangular co-ordinates be about ·07 inch for ten minutes. It is not a difficult matter to estimate by eye one-tenth of the distance between the curves drawn for each ten minutes. The total extent of the diagram will be large enough to permit of the whole working being carried out on a single sheet. Necessary arithmetical operations are merely addition and subtraction, the result is obtained in two or three minutes, and the manner of using the diagram is learnt very readily by anyone possessing an elementary education. This diagram also gives the hour angle when altitude and latitude are known; it solves great circle questions with ease; it replaces azimuth tables; and gives the hours of rising and setting, together with the amplitudes. In a word, it solves without calculation, but very rapidly and with sufficient exactness, all the problems of navigation and nautical astronomy involving spherical trigo-

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nometry, and replaces all books of tables except the Nautical Almanac. It has also a decided advantage over tables based upon the same or similar principles; inasmuch as no auxiliary estimated position is introduced, as in Sumner's method, to complicate the construction and decrease the exactness.

In the spherical triangle P Z S of Fig. 1 let P be the pole, Z the zenith, S the heavenly body. Then given P S = polar distance, P Z = co-latitude, and hour angle S P Z, we have to find the altitude $h = 90° - S Z$, and the azimuth P Z S. This may be effected by the aid of two right-angled spherical triangles, having one side common and the other sides differing by an amount equal to the co-latitude. The diagram enables us to obtain the two sides of a right-angled triangle, knowing the hypothenuse and one angle; or the converse thereof. Through S draw a great circle at right angles to the great circle P Z P_1 which it cuts at B. In the right-angled triangle P S B the sides P B, S B, are easily found when hypothenuse P S and angle P are known. Again, in triangles Z S B, P S B, it will be seen that the side S B is common, and the side Z B = P B − P Z. Hence hypothenuse S Z and angle Z can be determined. This method of solution was adopted by Towson, whose tables and diagram for simplifying great circle sailing and the determination of azimuths were published by the British Hydrographic Office in 1848. Sir William Thomson, now Lord Kelvin, drew up tables on a similar principle in 1876 for finding azimuths and hour angles. Since that date others have availed themselves of the same idea for drawing up tables to abridge the work of finding a ship's geographical position. Mr. Littlehales drew up handy diagrams for azimuths, hour angles, and great circle sailing, which were not long since published by the United States Hydrographic Office; and Weir's azimuth diagrams have received the highest praise from Lord Kelvin in a lecture on Navigation delivered at Liverpool, and Captain Wharton, R.N., Hydrographer, asserts that they give all that can be obtained from Burdwood and Davis, with the very minimum of trouble and without possibility of mistake; and more, because they give the true bearing of a celestial object for all altitudes and declinations.

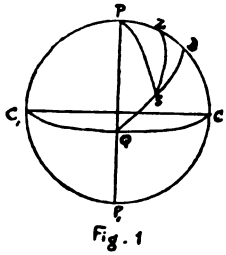

Fig. 1

In P S B the formulæ that connect the sides P B = β, B S = α, P S = d, and the hour angle P are $\cos d = \cos \beta \cos \alpha$,

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and cot P = cot α sin β. Now let P S take some definite value while P B and S B vary, then the curve represented by the first equation is constructed by measuring upon a horizontal axis the values of β, and upon a vertical axis the values of α expressed in degrees and minutes. Now give to d a series of equidistant values from 0° to 90°, say each 10°, and lay down the curves. Treat the second equation similarly and a second set of curves is obtained. Both sets are shown in Fig. 2A. For example, let β vary from 0° to 90° by 4°, while d = 20°, then the corresponding values of α are found from the equation cos d = cos β cos α which may be written cos α = $\frac{\cos d}{\cos \beta}$ = cos d sec β. When β = 0°, sec β = 1, cos α = cos d, α = d, so that the curve crosses the vertical axis at a distance of 20° from the origin. The other points are obtained by logarithms as follows :—

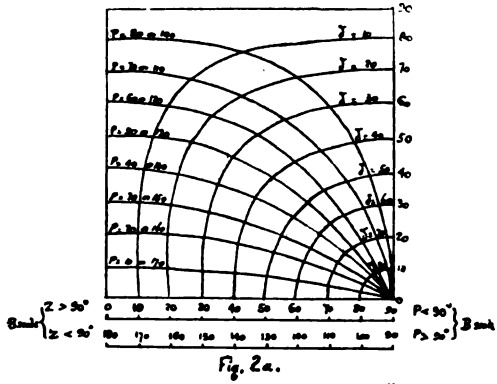

Fig. 2a.

20° cos 9·973	20° cos 9·973	20° cos 9·973	20° cos 9·973
4° sec 0·001	8° sec 0·004	12° sec 0·010	16° sec 0·017
19° 36′ cos 9·974	18° 25′ cos 9·977	16° 7′ cos 9·983	12° 9′ cos 9·990

Hence corresponding to abscissæ, or horizontal measurements, 0°, 4°, 8°, 12°, 16°, 20°; we have ordinates, or vertical lengths, 20°, 19° 36′, 18° 25′, 16° 7′, 12° 9′, and 0°. The curve drawn through the points thus found is the d curve of 20° = δ curve of 70°. The other δ curves are obtained similarly, and the P curves by using the formula cot P = cot α sin β. The plane figure is thus divided into a series of curvilinear quadrilaterals which can be made as small as we please, by drawing a sufficient number of curves. Sectional paper divided into tenths is suitable for reading off the rectangular co-ordinates. The point corresponding to given values of d and P is found directly from the numbers inscribed on the curves by interpolation at sight. The rectangular co-ordinates of this point give the values of α and β which correspond to the given values of

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d and P. Inversely, if we know α and β, the point is found by means of the corresponding lengths measured on the rectangular axes, and we get d and P from the curves. A geometrical explanation of this diagram is far from difficult and will facilitate its use. Hour angle curves are the loci of points of equal hour angle which are meridians on the sphere; d curves are loci of points of equal declination which are parallels upon the sphere. We can, by what has gone before, consider the curves drawn on this diagram as meridians and parallels of the sphere projected on to a plane. The construction of this projection is arrived at directly as follows. Imagine a vertical cylinder shipped over the sphere along the meridian P C P_1 C_1 of Fig. 2. Develop, following the generatrices of this cylinder, the great circles such as B Q making right angles with the meridian, and consequently all passing through Q. Small circles such as S F G H having Q for pole will become circles upon the cylinder; which, being slit up a generatrix and flattened out, gives a projection upon which equidistant great circles passing through Q are represented by equidistant straight lines, and equidistant small circles having Q for pole are equidistant straight lines at right angles to the first mentioned. In this projection meridians and parallels become the curves whose equations are given above. Hence the construction of the diagram on which the position of a point is fixed by means of its declination and hour angle, is much the same way as a place by its latitude and longitude on a map where the parallels and meridians are curved lines.

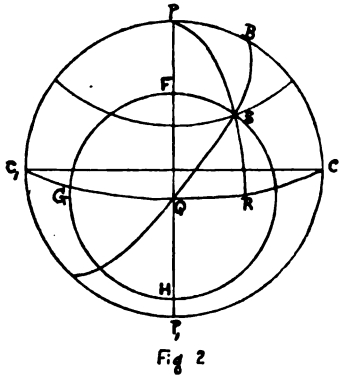

Fig 2

We have only dealt with one of the four quadrants of a hemisphere, but proceed to show that this suffices to solve the problem even when the triangle P Z S is not wholly in this quadrant. Only one hemisphere need be dealt with, since hour angles will be reckoned from 0° to 180° towards the east or west, and azimuths similarly, starting from the elevated pole. In practice declination = δ, and altitude = h, are preferred before polar and zenith distances respectively. Hence in first set of

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curves write δ instead of d, and upon the horizontal axis, not the distance β from the pole to B, but b = C B = the distance of B from the equator. The two points S and S_1 of Fig 3 are in quadrants 1 and 2; P B = P B_1 and P S = P S_1. Then the angles B P S, B P S_1, are supplementary; as, also the arcs C B, C B_1. We see that to each value of d there are two supplementary values of b and of P. It therefore becomes necessary to write on each hour angle or P curve, of the second set, alongside the angles which correspond to them, the supplements of these angles; and for the scale of abscissæ to write upon two horizontal lines the values of b from 0° to 90° and their supplements. The diagram's utility is thus extended to right angled triangles, of which P is one angle and the other two in the first or second quadrant, where we mean by first quadrant that which is bounded by the part of the meridian containing the zenith. There now remains to examine every possible arrangement of P, Z, S, and determine which of the angles inscribed on the curves ought to be read off in each case.

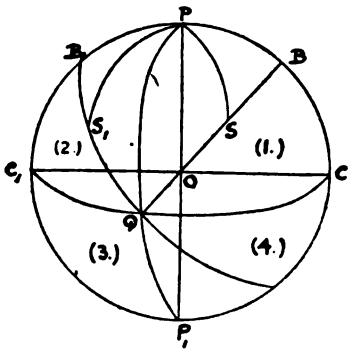

Fig. 3

Suppose that the heavenly body S is in the first quadrant of Fig. 4. In this case P is $<$ 90° and δ is of same name as latitude = ϕ. Also let Z lie between P and B. Knowing P S = 90° − δ, and the angle B P S = P we lay off the corresponding point on the diagram. The abscissa b of the point thus found gives arc B C, and the ordinate a gives the arc B S. It is required to find Z S, or its complement h = altitude, and the azimuth P Z S = Z. Revolve the triangle around O Q until Z shall coincide with P after moving through an angular distance Z P = co-lat. = l. Consequently B comes to B_1 and C B_1 = C B + l = b + l. Also S moves to S_1 and B_1 S_1 = B S = a.

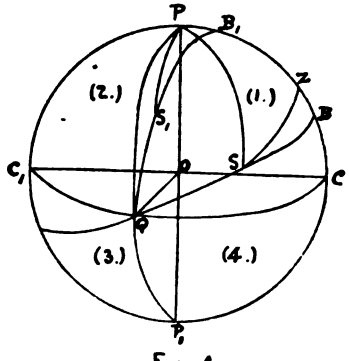

Fig. 4

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Then by means of the diagram it is easy to fix the point S_1 by its rectangular co-ordinates and to read off the value of $P S_1$ or its complement h from the δ curves and the value of $C_1 P S_1 = Z$ by the P curves. Note that in this case, in order to obtain Z, we must take that one of the two values inscribed on the P curves which is $> 90°$. We shall also have $B = (b + l) < 90°$. Finally, in this example $P < 90°$, $b < 90°$, $B < 90°$ and $Z > 90°$.

Again, suppose that S is still in the first quadrant but B is between Z and P as in Fig. 5. Then P is still $< 90°$ and δ is same name as ϕ. Turn triangle B Z S around O Q so that Z shall coincide with P, B with B_1, and S with S_1. We determine the values of $C B = b$, and of $B E = a$ by means of the diagram from the data δ and P. In solving the triangle $B_1 P S_1$ equal to the triangle B Z S we know the abscissa $C B_1 = (C B + l) = (b + l)$ and the ordinate $B_1 S_1 = a$. The value of h is read off from the δ curves and the value of the angle $B_1 P S_1$ = azimuth by means of the P curves. In this case, however, it is necessary to take that one of the two angles inscribed upon the P curves, which is $< 90°$. Here, $P < 90°$, $b < 90°$, $B > 90°$, $Z < 90°$.

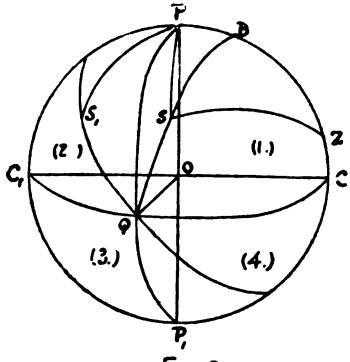

Fig 5

Now let S be in the second quadrant as in Fig. 6. In this case, P is $> 90°$, the δ and ϕ are of the same name, and $b = C B > 90°$ it is necessary to take for abscissa of S that one of the two angles inscribed on the horizontal scale which is $> 90°$. Turn the triangle P Z S around O Q so that Z, B, E, coincide with P, B_1, E_1, respectively. We are led, by the same reasoning as precedes, to the same method of solution and find always that $B = b + l$. But in this case B is $> 90°$ and Z will be $< 90°$.

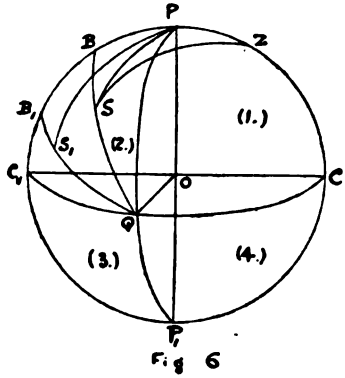

Fig 6

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Therefore, in the second quadrant P > 90°, b > 90°, B > 90°, and Z < 90°.

Now let S be in fourth quadrant, as in Fig. 7. Then P < 90°, while δ and ϕ are of contrary names. B is remote from C with respect to P. Consider the triangle P_1 S B in lieu of P S B. We have $\delta = (90° - P_1 S)$ and angle S P_1 B = S P B. Hence, using diagram, we find arc C B = b = abscissa of S, and arc B S = a = ordinate of S. Turn triangle Z S B so that Z shall coincide with P, S with S_1, and B with B_1. Determine point S_1 on the diagram, having for abscissa B = C B_1 and for ordinate a = B_1 S_1, and read off from δ curves the complement of P S_1 = h and from P curves the angle C_1 P S_1 = P Z S = azimuth. Care must be taken to use that one of the two angles inscribed on the P curves which is > 90°. Here C B_1 = (B B_1 − C B) = B = (l − b); or, if we agree that b is negative when δ is of contrary name to ϕ, we shall still have B = (b + l). Therefore, P < 90°, b < 0° < 90°, B < 90° and Z > 90°. S can never be in the third quadrant, as it would then be below the horizon. Carefully combining the above conclusions, it is easy to deduce the practical working rules which are given below.

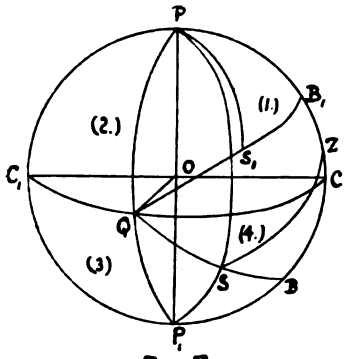

Fig 7.

The diagram replaces azimuth tables since the azimuth of Z is readily found from δ = declination curves and P = hour angle curves. It also serves to find the name of a star whose h and Z have been observed. The method of working is similar to that indicated above, but in an exactly inverse order, as detailed below. This diagram may also be used for finding the time of rising or setting of a heavenly body and its amplitude. In this case we have given δ, 90° − ϕ, and h = 0°. It is seen at a glance that B = 0° or 180°, and b = (B − l), whence b = − l or b = 180° − l. Seeking the point of intersection of the vertical corresponding to b with the δ curve it is evident from Fig. 8 that the first value applies when the heavenly body S is in the fourth quadrant; or, in other words, when δ and ϕ are of contrary name. The second value

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applies when S is in the second quadrant where δ and ϕ are of same name. In the first case read $P < 90°$, and in the second case $P > 90°$. In order to obtain an amplitude follow the horizontal line passing through the point of intersection up to its meeting with the left hand vertical corresponding to $B = 0$ and seek the value of Z for that point. But it is evident that the value of $Z < 90°$ is equal to the ordinate a of the point which is the value belonging to the case where δ and ϕ are of the same name. In the contrary case we must take the supplement of this angle.

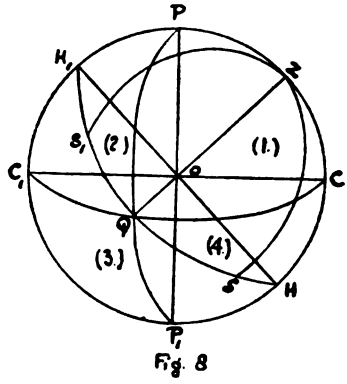

Fig. 8

The hour angle also may be determined by use of the diagram from the data h, δ, and ϕ. In order to show how this can be done the projection previously referred to will come in handy. Draw meridians and parallels upon a hemisphere at equal distances apart, and write upon these lines the hour angle = P and the declination = δ which belong to them respectively, as in Fig. 9. Fit a cylinder round the sphere along the meridian P C P_1 C_1 and develop along the generatrices of the cylinder those great circles which pass through Q and are, therefore, perpendicular to the meridian. Divide the cylinder along a generatrix passing through P_1 and unroll it into a plane, as in Fig. 10. Meridians and parallels have there become the curves shown bearing numbers corresponding to those on the meridian. This projection is made up of four parts that are equal and symmetrical in pairs. Folding it

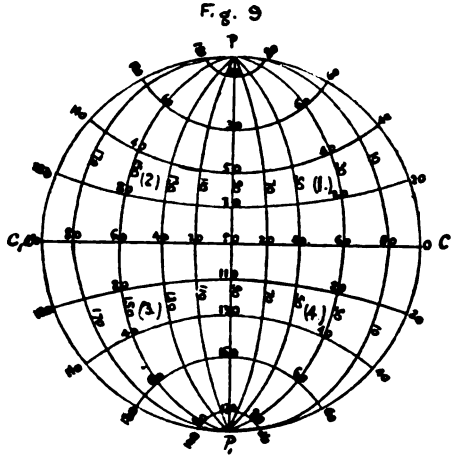

Fig. 9

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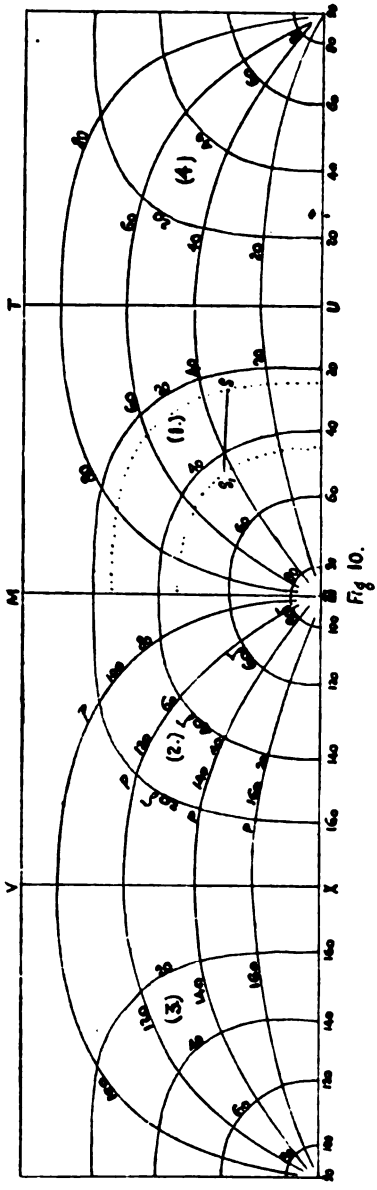
down M N, and again down X V the curves superpose, and it is sufficient to write close together on each curve its two supplementary values. Below, on one line write the angles 0° to 90°; and, on another line directly beneath, the supplements thereof. The portion V M N X will serve equally well for every case. We have shown that in order to find Z and h the point S must be moved through an angle l on the sphere. This is effected on the diagram by displacing the point along a horizontal line by a length l measured on the scale below. It will then be in S_1. Draw the curve passing through S_1 as indicated by a dotted line on the diagram. This curve may be drawn beforehand since we know the altitude = h. We may also lay down the δ curve of S and it is known that the distance S S_1 between the two points is = l. Let the δ and h curves be drawn and take a length S S_1 upon a flat ruler. Lay the ruler along a horizontal line and move it parallel to its original direction, so that S follows the h curve up to where S_1 meets the δ curve and the hour angle may be read off the P curve. Note that if S on the ruler describes the h curve then S_1 describes a similar parallel curve at a distance apart = b. If the curve be traced on transparent paper the intersection of the two curves is found by moving the tracing through the distant l. A second figure identical



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with the first enables us to solve the problem by a method analogous to that of Keller's planisphere, but rotation is replaced by translation along a straight line. S and S_1 may be in different quadrants so that the whole development has been dealt with. Nevertheless a diagram representing one quadrant is sufficient, provided the tracing be carefully turned if necessary to pass from one quadrant to another. The proper position for the tracing is determined by means of the double graduation and following a rule analogous to that established for the first quadrant. Large tracings are awkward, and the following artifice has been resorted to that the result may be arrived at in a practical and rapid manner. An approximate azimuth of a heavenly body is always known, whether by compass bearing, or from the diagram using the hour angle given by the chronometer. Hence the position of S_1 is roughly known, and we need only have a tracing of that small portion of the h curve upon which it must be. Moreover, if 10′ curves are drawn on the diagram, two small portions of two neighbouring curves are almost rigorously superposable. In the vicinity of this roughly found S_1 make a small tracing of the h curve nearest to that which is required. Shift it horizontally till it pass through S_1. Mark upon the tracing the horizontal and vertical lines near S_1 which correspond to whole degrees. Let them be B_2 and a_2. Subtract l from B_2 and call the result b_2. Mark on the diagram the point having co-ordinates b_2 and a_2, then move the point B_2 a_2 of the tracing on to the point b_2 a_2 of the diagram. This gives the intersection of the h curve with the δ curve. This last curve need not be laid down, for it will be easy to divide by eye the distance between the intersections of the h curve and the two curves comprising the given value of δ. The given rule must be carefully followed and the tracing turned when S and S_1 are in different quadrants. This operation entails a tedious explanation, but is in practice almost as simple as that for determining the *point rapproché*, which may be defined as that point on any Sumner line determined by one altitude which is nearer the true position than any possible position by dead reckoning. Nevertheless the last method will be preferred at sea. With respect to determining the hour angle in order to find the absolute state of chronometer by means of shore observations, it will be found that the approximation of 1′ of arc given by the diagram, although within practical requirements, will generally be insufficient.

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Cases may occur, however, where the hour angle by diagram would be useful, as, for example, verification of calculations.

The diagram helps us to find course and distance on a great circle. This problem is the same as that for determining the *point rapproché*. Here l = co-lat. of starting-point, δ = lat. of arrival, P = diff. long. The azimuth gives course counted from 0° to 180° from the elevated pole, h the distance which may be $>$ 90°. We confine ourselves to a recapitulation of the different positions that S and S_1 may take. Make $B = (l + b)$ and take b negative in agreement with rule previously established then a negative value may be found for B; or, if b is positive, B is $>$ 180°. In this case $B_1 = -(360° - B)$. Apply the second rule to absolute values of B_1; but, if negative, then the supplement of the value found for h must be used in order to obtain the great circle distance. The practical rule is given later on.

At the first glance it might seem, having regard to the deformation of projection and the small angles under which the curves cut in some parts, that the results are untrustworthy in portions of the diagram. But we may remark that the projection employed only expands the small circles of which the plane is parallel to the meridian, when they are near the pole Q, in the same ratio throughout their length while maintaining their respective distances apart. The distances of their points of intersection with meridians and parallels are increased in a constant ratio for a given small circle, and in moving a point along the horizontal line which represents it, the point's position can be determined all along this line with equal accuracy. Moreover, the exactness of the determination of the rectangular co-ordinates matters little provided that of the results remains the same. That part of the diagram where deformation is considerable corresponds to altitudes that are too small to give good results. Azimuths are not obtained from the diagrams with the same approximation to truth, but they are accurate enough for Sumner's method and every other practical purpose at sea. Taking as the scale for rectangular co-ordinates ·4 inch = 1°, and drawing 10′ curves, the minimum interval of two δ curves is about ·07 inch; it is easy to interpolate at sight to one-tenth nearly, and thus obtain an approximation to 1′. This scale diagram will form a square of about 36 inches side, which may be divided horizontally into two sheets fit for actual work. It is evident at a glance upon which of the two portions the heavenly body is, and the other

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point having to be moved horizontally only, the operation is effected entirely on one sheet. The diagram allows us to measure variations of results as functions of the variations of data, and favourable conditions for observing are clearly indicated. The portion V M N X of Fig. 10 and Fig. 2A represent the general arrangement and form of the curves, but for practical use the diagram is on a much larger scale with 10′ curves, instead of 20° curves as here shown and drawn upon sectional paper divided into tenths, so that the rectangular co-ordinates are perceived without trouble.

To determine the *point rapproché*. Known quantities are δ, P, l, and the unknown h, Z. The P curves represent meridians, and δ curves parallels of celestial sphere. Fix heavenly body by its δ and P curves, estimating minutes at sight. Read the rectangular co-ordinates of the point thus found, a upon vertical scale, b upon that horizontal scale which agrees with value of P. Then $b >$ or $< 90°$ according as P is. Make $B = (l + b)$ where b is negative if δ and ϕ are of contrary names. Find point whose rectangular co-ordinates are a and B. The P curves now represent vertical circles, and the δ curves circles of equal altitude. The estimated h is read by means of δ curves, and Z by P curves. If B is $< 90°$ then $Z > 90°$, and if $B > 90°$ then $Z < 90°$. The rectangular co-ordinates being only given to whole degrees on the diagram, a tracing paper diagonal scale may be made to read the minutes. As a rule, it is not necessary to read the minutes of the ordinate a; it will be enough to take with a pair of compasses the distance of the point from the neighbouring horizontal of the diagram and transfer this measurement to the edge of the tracing when it occupies the second position. The line of altitude must afterwards be drawn on a chart or on a special sheet of paper in the usual way.

The method of using the diagram as an azimuth table has been dealt with above.

To find the name of a given star by the diagram is exactly the inverse of that just explained. We have the values of h, Z, and l to find δ and P. Fix the star by its h and Z. Altitudes may be read from δ curves and azimuths by P curves. Read the co-ordinates of the point thus found, a on vertical scale, B on that of the two horizontal scales which suits the Z value. B is $<$ or $> 90°$ according as Z is $>$ or $< 90°$. Make $b = B - l$. Fix the point that has rectangular co-ordinates a and b, and read δ on the δ curves, P on the P

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curves. When b is $<$ or $>$ 90° then P is $<$ or $>$ 90°. If b is negative, then δ and ϕ are of contrary names.

To use the diagram for the purpose of finding the time of a heavenly body's rising or setting, and its amplitude, we have given $h = 0$, δ, and l, to find P and Z. Seek the point S where the δ curve meets the vertical line passing through the point $b = l$. The hour angle of rising or setting is found from the P curve passing through S. Read P $>$ 90° if δ and ϕ are of the same name, and P $<$ 90° if δ and ϕ are of contrary names. The ordinate a of S read upon the vertical scale will give the amplitude if δ and ϕ are of the same name, but if of contrary names, then the supplement of a must be taken.

Method of using the diagram for finding the hour angle is as follows:—We have given h, δ, l, and the approximate azimuth = Z_2 to find P. Fix the heavenly body in S_1 by its h and Z_2 using the δ curves for h, and P curves for Z_2. Make a tracing of the δ curve nearest this point between the two limiting values of P between which the true azimuth must lie. Trace the nearest horizontal to S_1 and let a be the round number of degrees to which it corresponds upon the vertical scale. Move the tracing paper along the horizontal so that the traced curve shall pass through S_1. Mark the intersection of the horizontal a_2 with the vertical nearest to S_1, let B_2 be the round number of degrees to which it corresponds on the horizontal scale. If $Z_2 < 90°$ then $B_2 > 90°$ and if $Z_2 > 90°$ then $B_2 < 90°$. Make $b_2 = (B_2 - l)$; place upon the diagram the point whose co-ordinates are a_2 b_2 and superpose on this point the point a_2 B_2 of the tracing. Read off the value of P given by the intersection S of the traced curve with the δ curve which corresponds to the declination of the heavenly body. It is unnecessary to trace the δ curve for the position of S between the two neighbouring curves of the diagram is easily estimated by the eye. If $b < 90°$ then P is $< 90°$ and if b is $> 90°$ then P is $> 90°$. If when Z_2 is $< 90°$ we find that b is $< 90°$, or if δ and ϕ are of contrary names, then the tracing paper must be turned round.

For great circle purposes we have l = co-lat. of starting-point, δ = lat. of arrival, P = difference of longitude between the two points; we have to find Z = the course reckoned from 0° to 180°, and h the distance. The P curves represent terrestrial meridians, and the δ curves parallels of latitude. Fix the arriving point by its ϕ and difference of longitude with the starting-point by means of the curves, estimating the

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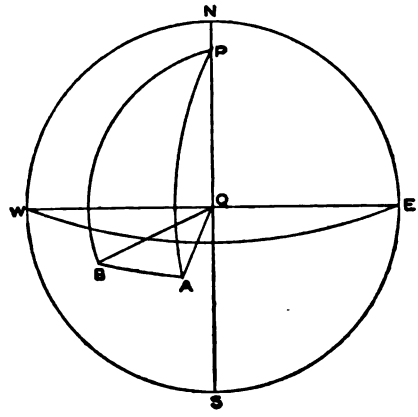
minutes by eye. Read the rectangular co-ordinates of the points thus fixed, a upon the vertical scale, b upon that of the two horizontal scales which suits the value of P. If P is $< 90°$ then b is $< 90°$, and if P is $> 90°$ then $b > 90°$. Make $l + b = B$ regarding b as negative if the latitudes are of contrary names. Fix the point that has for rectangular co-ordinates a and B and read the direction of ship's head by means of the P curves and the distance by δ curves. If $0° > B < 90°$ then $Z > 90°$, if $180° > B > 90°$ then $Z < 90°$, if $B > 180°$ then take $B_1 = (360 - B)$, and if $B < 0°$ then take $B_1 = -B$. In the two last cases we apply the second rule to the values of B_1 in order to read Z, but to find the distance between the two points it is necessary to take the supplement of the value of h furnished by the diagram.

WILLIAM ALLINGHAM.

THE DOUBLE ALTITUDE PROBLEM.

CAPTAIN Parker's ingenious and carefully elaborated memoir on the double altitude problem, in the *Nautical Magazine* for September, in which he assumes the accuracy of the time-interval as obtained from the chronometer difference of time corrected for the ship's run meanwhile, suggests the question, why not compute the latitude and longitude, azimuth also, by direct spherical trigonometry?



What has to be done is to solve the three triangles APB, A Z B, and B Z P, to find B Z, the angle B P Z and the angle P Z B, *see figure.*

Take example No. 1:—The true time-interval is 1 h. 22 m., equal to 20° 15′. As the first observation was only a few minutes after noon, the bearing of the sun may be taken as S. 2°

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W. This, with the ship's run in the interval, gives 4′ to be added to the first altitude to reduce it to the place of the second observation, and the zenith distance becomes 27° 39′ 45″. All the rest of the data is as stated in the memoir.

In the triangle A P B, the two polar distances and the included angle are given; whence the angles A B P and B A P, and the side A B can be found. The three sides of the triangle A Z B are now known, and the angle A B Z can be computed, which, subtracted from the angle A B P, leaves the angle Z B P. In the triangle Z B P, the angle Z B P and its containing sides are now known; hence the angles Z P B and B Z P and the side Z P can be computed. Now, B Z P is the azimuth, and, if it had been observed by compass, the compass error would be obtained. Z P B is the apparent time whence, assuming the chronometer gives Greenwich time, the longitude is found. Z P is the co-latitude.

The data so worked gives for the second position, latitude 8° 39′ N., longitude 71° 17′ 18″ E.; results as good, and probably better, than those obtained by the proposed method.

Is it that navigators generally are not equal to direct spherical trigonometry that fudging rules are adopted?

R. STRACHAN, F.R. Met. Soc.

CORRESPONDENCE.

ARCTIC EXPLORATION.

To the Editor of the "Nautical Magazine."

SIR,—It seems probable that Polar expeditions will be "in the air" next spring. I presume the Norwegian expedition has not been given up?

I believe it is correct that some Dundee whalers are, even now, on an Antarctic trip.

Lieutenant Peary and his wife have just returned home triumphant, and have added another victory to the splendid American record of Arctic achievements. Peace has her victories no less renowned than war. Have our own Government finally closed the British naval chapter of Arctic research? If utilitarianism in the present Government is too strong to be overcome, can we not persuade any of our many rich civilians to finance another British Arctic expedition?

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Could we not at least join hands with Norway, and supplement the attempt to be made by that country?

Suppose that expedition started safely through Bering Strait, hoping to drift home *viâ* Smith Sound or Spitzbergen, could we not send an expedition to meet them, and, at any rate, plant *cachés* of stores at, say, Lady Franklin Bay, where Greely wintered, and at Lockwood's farthest, or on other spots which Arctic explorers could suggest?

Scandinavia claims the glory of the north-east passage, America that of farthest north and the solving of the secret of Greenland's northern coast. If this present expedition is successful, it is possible that the "Pole" may fall to their share! The greatest maritime country of this or any age should not stand aloof, even if we *are* a nation of shopkeepers. What does Captain Markham say?

Yours truly, POLARIS.

"PORT" AND "STARBOARD" COLLISIONS AT SEA.

To the Editor of the "Nautical Magazine."

SIR,—In March 2nd, 1889, I communicated with Mr. Thomas Gray of the Board of Trade, and informed that gentleman that a frequent cause of collisions at sea was the *contrary* meaning of the words "port" and "starboard," and suggesting that the words right and left wheel might be substituted. The Board of Trade acknowledged the letter, and stated "that further communication on the subject might be desirable." Since then I believe the German Navy, North German Lloyd's, and Hamburg American Line have substituted "right and left wheel" for "port" and "starboard," and I think it would be desirable if made international. That the *ambiguity* of the words in present use are the direct cause of many collisions I have not the slightest doubt from my own experience. It seems monstrous to me that there should be any *uncertainty* in a command fraught with so much danger to life and property, and in the H.M. Navy it must be infinitely worse, as a false move in a critical moment might result in disaster to the nation. Such *equivocal* commands would, I think, not be tolerated in the Army for a moment. I do not mean to say the meaning of port and starboard is not perfectly understood by all seamen, "but on getting a *sharp order* to port his helm, he is very liable and *very often does* put the wheel over to the port side instead of the starboard, and *vice versâ*, or stands

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undecided which way to turn the wheel." This is very often the case when prompt action is most necessary. The words "port" and "starboard" might remain as they are, *if they were not associated with quite an opposite meaning in the numerous other operations on board ship.* The officer of the watch is as liable as the man at the wheel to get confused, for should he wish his vessel's head to go to the *right* he must use a word that means *left* on any other occasion. In regard to lights, I do not think any advantage would be gained by any addition to the lights in present use, as they are confusing in crowded waters as it is, and any additional danger lights might lead to over-confidence and disaster should they fail. I do not think a light indicating an approximate course would be of any benefit unless it indicated the *exact course and the speed and distance* of the vessel. That the holding vessel should keep the *course and speed* unless a collision is eminent I perfectly agree with.

I remain, dear Sir, yours respectfully,

WM. LAX.

33, Grey Street, North Shields, October 17th, 1892.

THE DANGERS OF BULK OIL STEAMERS.

To the Editor of the "Nautical Magazine."

SIR,—I have just read in your September issue a letter, signed G. H. Little, on the sea transport of petroleum; in concluding his letter he remarks:—The trade in bulk petroleum is destined to rival *coal* and *grain;* those who have the foresight to establish themselves in it now, will in a few years reap the reward of energy and enterprise.

I say in response, avast heaving, Mr. Little, that is rather a wild assertion to make, for there are a great number of shipmasters who differ with you in that respect, and I as one of the class will now take the liberty of airing my thoughts in our good *Nautical* on the subject, as its fairness and impartiality on all vexed questions of the sea are proverbial.

Since the bulk oil trade sprang into existence death and disaster have been its leading characteristics. The veteran George Augustus Sala once wrote: "The sun at noon-day dazzles, and *distance* lends enchantment to the voice of a powder magazine, Vesuvius, or a mad dog," and I truly think George might have added to that category, *a tanker;* for really they have been killing, setting fire to other peaceful merchantmen, and blowing themselves up ever since they

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were first created. In docking these *magazines* especial care is absolutely necessary, as they are liable to bend and buckle all ways and emerge from a graving dock as leaky often as a sand barge. Then why is this? Simply because every rivet and joint about them, where petroleum can get access to, is loosened considerably.

If we have a shackle-pin set fast, or a spindle, &c., we simply lubricate it well with petroleum, and eventually the pin of a shackle will drop out of its own accord.

This simple every-day experiment at once accounts for the constant leakage of bulk oil steamers, for no matter how well they may be built, the action of the petroleum searching its way in amongst the riveting and caulking of the shell plating of the vessel in time loosens all her joints.

Cement will crack on shipboard, then in goes master petroleum, and as old father time rolls on, turns the rigid structure into a mass of working joints, and she jingles in a heavy sea-way like a bag of hammers.

We are repeatedly told that by carefully manning tankers with select crews and picked officers all danger can be eliminated. Now this, in my opinion, is all tommy rot. Sailors and firemen will be sailors and firemen all the world over, and must *strike a light* to have a smoke at times, even when sitting on a keg of gunpowder, so much so, that after all lights are ordered out on board of a well-disciplined man-of-war, many hundreds of seamen are annually punished for infringing this law by having a quiet smoke in their hammocks. The master, officers, and engineers may or may not be all superior men, but I feel certain you will not find *one* good experienced shipmaster in this country who will vouch for great prudence and care in every member of a ship's company of 25 or 30 men. I well remember reading, only a few months ago, that at a great mine accident in America, 14 or 15 dead miners were found to have concealed about their persons both tobacco, pipes, and *matches*. This at once proves how cussedly careless some men are of their own lives; and mind, neither Mr. G. H. Little or any other man can circumvent this grave source of danger in a tanker, even with the strictest discipline possible in a merchant steamer.

Therefore, this alone constitutes the gravest danger in a tanker, and I feel confident if dead men could arise and tell tales, and speak truth, every tanker that has blown up would be mighty easy accounted for.

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I consider, with many others, tankers are a curse to the world's marine, as they endanger all the vessels they come near, and ought to be prohibited entering any crowded waterway *under any circumstances*, and that the men who man such craft ought to have *treble wages* paid them for the great risk they run of their lives. I wonder if Mr. G. Little would like to command a tanker for a few years, and take his family with him now and again for a summer outing. I somehow guess he'd rather not.

The other day I chanced to fall across a few seamen and firemen belonging to a tanker in France, who were going on board in a *very happy state*, and to judge by their demeanour and behaviour, they were evidently not the superior class of men we have heard so much about lately. I would have been sorry to change my crew for the set of scamps I saw that evening I assure you, Mr. Editor, and yet I only command an ordinary old tramp.

I have also heard remarked that first-class seamen and firemen have a great aversion to tankers, and will not ship in them, but that they are principally manned by crews whose characters would not bear very strict examination. But I am not in the trade, nor likely to be, so which to believe I leave Mr. Little and others who advocate tankers to draw their inferences.

My opinion is this, if you can build a tanker so that no petroleum can come in contact with her bare iron, and man her with a crew who are true as steel, and can implicitly trust one another fore and aft in all their work, both at sea and in harbours where wine and grog are cheap, then when you can do this, but mind, *not before*,—you can go on my good Mr. Little, and build away your tankers; but if you cannot build and man them to these conditions, quite independent of temperature of canals and flashing points of oil, I say it is better at once to pronounce them as grave dangers to navigation in general, and forbear for the future lauding them to the skies, for the edification of a special minority of shipowners who invest in them, quite regardless of the issue to life and limb, as long as the vessel will roll in a good percentage.

I trust I have not offended anyone by these remarks, if so, please pardon me, kind readers, my excuse being I am arguing for the welfare of all British sea-going men. Facts are stubborn things to deal with—the existence of the tanker is a fact, and it requires plain straightforward truths to upset dangerous

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monopolies; and, in doing so, we at times offend a few for the good of the many, and I am sorely afraid, Mr. Editor, this is my case at present.

Remaining, Sir,

Yours very obediently,

Bilbao, 11th October, 1892. RHADAMANTHUS.

BOOKS RECEIVED.

Universal Synchronous Tidal Diagram: British Islands, No. 1. By R. A. Edwin, Retired Commander R.N., and Wm. Caius Crutchley, Lieut. R.N.R. London: John Lilley and Son, 10, London Street.

THE diagram shows in a graphic form the state of the tides, the direction of the principal streams in the English Channel, and the depth of water in feet for each hour above low water ordinary springs. The ports are those between London Bridge and the Scilly Islands. By means of a series of 31 parallel lines, each line representing the tidal conditions of a given port, the synchronous state of the tide at the ports on each side of the English Channel is seen at a glance. Each line is partly black and partly red; black for flood, and red for ebb. On a scale of half-an-inch for one hour the depth above low water springs is recorded hour by hour, and read off beneath a movable time indicator which has been set to the high water (vertical) line of a standard port. The two standard ports selected are Devonport and Dover.

The rule given on the diagram is as follows: On the vertical line passing through the left-hand high water mark of the place taken as a standard, set the *movable* hour scale to the time (shown in the Admiralty Tide Tables) for high water on the date of using; then the state (ebb or flood) and depth of the tide at any time for any place shown on the diagram can be seen at a glance. We should recommend, as there is space on the diagram, that an example be given beneath the rule.

The diagram is based on the data of the Admiralty Tide Tables, and so far as we have tested cases, is sufficiently accurate. Hung up in the chart-room it will be found useful and handy. The hour slip scarcely slides as freely as it should do.

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THE ROYAL NAVAL RESERVE.

"JUSTICE TO NAVAL OFFICERS."

THE articles and correspondence which have recently appeared in the *Times*, under the heading of "Naval Officers and a Discreditable Project," must have a peculiar interest to officers of the Royal Naval Reserve, who, at the present moment, are contemplating united action with a view to removing the slur cast upon them by the action of the late Board of Admiralty in connection with the Indian Marine; as the main question raised by the *Times* is whether or not Naval officers can unite together with propriety, or without a grave breach of discipline, to obtain a redress of their grievances, and from the arguments *pro* and *con*, we think it will be apparent to the most timid and fearful officer of the Reserve that no matter how hard and fast an officer on the active list may be bound by the Articles of War and the Queen's Regulations, a Reserve officer when not attached to the Fleet is at perfect liberty to exercise his undoubted rights as a citizen and civilian in the matter of combination to secure justice and in ventilating his grievances in the Press. We propose, therefore, to give the *Times* controversy something more than a passing notice.

The *Times* quotes at length the Articles of War and the Queen's Regulations relating to combinations and writing to the newspapers, which are as follows—

Article 37 of the Naval Discipline Act enacts that:—

"Every person subject to this Act who shall have any cause of complaint, either of the unwholesomeness of the victuals, or upon any other just ground, shall quietly make the same known to his superior, or captain, or commander-in-chief, and the said superior, captain, or commander-in-chief shall, as far as he is able, cause the same to be presently remedied; and no person subject to this Act upon any pretence whatever shall attempt to stir up any disturbance, upon pain of such punishment as a court-martial may think fit to inflict, according to the degree of offence."

And Article 87 indicates the application of the Act thus:—

"Every person in, or belonging to, Her Majesty's Navy and *borne on the books of any one of Her Majesty's Ships* in Commission shall be

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subject to this Act, and all other persons hereby made liable thereto shall be triable and punishable under the provisions of this Act."

Article 636 of the Queen's Regulations runs:—

"All combinations of persons belonging to the Fleet for the purpose of bringing about alterations in the existing rules and regulations of the Royal Navy, whether affecting their interests individually or collectively, are prohibited, as being contrary to the established usage and practice of the service, and injurious to its interests and discipline. Every person is fully authorised individually to make known to his superior any just cause of complaint, but individuals are not to combine, either by the appointment of committees, or in any other manner, for the purpose of obtaining signatures to memorials, petitions, or applications, nor are they collectively to sign any such documents."

And Article 637 says:—

"All persons belonging to the Fleet are forbidden to write for any newspaper on subjects connected with the Naval Service, or to publish, or to cause to be published, directly or indirectly, in a newspaper or other periodical, any matter or thing relating to the public service."

The foregoing, we believe, contain all that is applicable to the situation, either in the Act or the Queen's Regulations, and the position of Reserve officers with regard to movements for the improvement of their position and for the removal of abuses and grievances being thus clearly demonstrated, we pass to another phase of the *Times* controversy which has its peculiar interests for them, inasmuch as the attack by the *Times* on what is known as the "Justice to Naval Officers" movement is the deliberate and discreditable attempt of a powerful newspaper, at the evident instigation of the authorities, to crush at the outset those public-spirited Naval officers who have had the hardihood to openly complain of the grievances under which they suffer, and to ask in a legitimate and orderly manner that justice may now be done them. This attempt to closure their Naval brethren will meet, we are sure, with the hearty condemnation of every officer of the Royal Naval Reserve.

The facts of the case appear to be that Commander Charles N. Robinson, R.N. (retired), who holds the post of Assistant Editor of the *Army and Navy Gazette*, some time ago forwarded a circular to the ward-room officers of all Her Majesty's ships in commission, asking for their views on certain points, which, it is admitted, constitute their chief grievances. The responses were so numerous and unanimous as to what constituted their grievances, accompanied by entreaties for aid to obtain redress,

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and promises of financial support from senior and junior officers alike, that Commander Robinson—who, we imagine, took the first step with an eye to service "copy" alone—determined to go through with it, or, as he himself expresses it—

"The movement to obtain redress now that substantial support—both financial and otherwise—is assured, will be carried on until it finds expression in Parliament. All that is necessary to insure a hearing will be done, we may be sure, and this is more than half-way towards a successful issue."

Subscriptions from nearly every ship in commission were pouring in fast, and the movement was going on swimmingly, until the letter of a "Citizen and Officer" appeared in the *Times*, denouncing the movement as "a discreditable project," and declaring that Naval officers "who have not hitherto felt that they had any grievance to complain of" were being "goaded into inventing some by circulars," addressed to every ship in commission. The writer went on to declare the plan as projected both "illegal and insubordinate," because a breach of the Articles of War and the Queen's Regulations, and wound up with the extraordinary expression of opinion that—

"If they have real grievances, Naval officers have everything to hope from the sympathy and the generosity of the country; but that sympathy and that generosity are likely to be frightened out of existence if the officers so far forget the plain rules of patriotism and professional honour as to descend to the use of illegal and insubordinate means when trying to secure compliance with their demands."

—an expression of opinion that few Naval officers will read, from the Commander-in-Chief downwards, without "winking the other eye."

Commander Robinson at once wrote to the *Times*, giving a plain statement of the case, and fully admitting his connection with the movement. In the next issue appeared an article of over two columns denouncing Commander Robinson, the *Army and Navy Gazette*, the plan of campaign, and every Naval officer connected with it, and declaring that "the movement ought not to have a moment's support from any officer, high or low, so long as the Queen's Regulations and the Naval Discipline Act remain as they are." This fulmination, which the *Army and Navy Gazette* stigmatises (with good reason) as an official *communiqué*, is particularly unfair to our service contemporary, inasmuch as the attempt is made to saddle that paper with the responsibility of issuing the circular and thus initiating the movement which has awakened s

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much alarm in the official mind, but the fact is perfectly clear that the only connection between the *Gazette* and the movement existed in the fact that Commander Robinson and the Assistant Editor of that paper are one and the same person.

However, the question as to who is entitled to the blame (or, as many think, credit) of having initiated the movement is an immaterial one, beside the important question of the legality of the movement, and whether it is to be continued to a successful issue, or nipped in the bud. The *Times* maintains that the only way a Naval officer may make known his cause of complaint is through his superior officer. We have had some experience of that mode of obtaining redress in connection with the Indian Marine precedency question. A large number of the senior officers of the Reserve individually addressed a respectful remonstrance through their superior officers to the Admiralty as to the treatment accorded them, with the result that they merely received a snub for their pains, and one of their number who has distinguished himself by his energy and zeal since he entered the service, in promoting the interests of the Reserve, was practically told that if he did not like his altered position he had better send in his papers.

No, Mr. Walter, "so long as the Queen's Regulations and the Naval Discipline Act remain as they are" they are behind the age, and any attempt to interpret them too strictly will only secure at an early date their much needed amendment. Writing to the papers is now the legitimate and recognised medium of every subject of Her Majesty, who has, or imagines he has, a grievance, for soothing his mind, and relieving his feelings, and the tendency to do so, instead of being repressed, should rather be encouraged, as the Press is the safety valve of public opinion. Let the *Times* and their Lordships beware if they attempt to sit upon it.

We trust, therefore, that Commander Robinson and his friends having put their hands to the plough, will not now dream of looking back, notwithstanding all this twaddle about the Queen's Regulations, the Naval Discipline Act, and *noblesse oblige*, and we are sure they will have the entire sympathy of every right-minded subject of Her Majesty with them in the movement, which we hope to see carried to a successful issue. Of this we are certain, the discreditable attempt of the *Times* to give to an orderly and legitimate movement, amongst naval officers, to secure certain much-

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needed reforms in their conditions of service, the complexion of an *émeute* in the Guards, will not readily be forgotten nor forgiven, and will, in the end, only help on rather than retard the movement.

THE GAZETTES.

Admiralty, September 17th.

Sub-Lieutenant H. W. Bennett to be Lieutenant (to date September 16th, 1892).

Admiralty, October 1st.

Sub-Lieutenants F. Mayoss and G. D. Saunder to be Lieutenants (both dated September 29th, 1892).

Admiralty, October 7th.

Engineer P. Smith to be Senior Engineer (to date October 6th, 1892).

APPOINTMENTS.

Lieutenants: R. Dowling to *Excellent* (additional) for short course of gunnery (to date October 22nd), and then to *Narcissus* for twelve months' training (to date December 17th); C. A. Mossman (acting), G. P. C. Hunt (acting), and J. D. Ross (acting) to *Excellent* (additional) for short course of gunnery and torpedo instruction (to date October 22nd); W. Hocking to *Excellent* (additional) (to date October 22nd); P. Cullen (acting) to *Royal Sovereign* (additional) for disposal; R. P. Parkman to *Excellent* (additional) (to date October 22nd); A. Deas (acting) to *Excellent* (additional) (to date September 10th). Sub-Lieutenants: G. B. Powell (acting) to *Inflexible* (to date October 1st); H. Butterworth to *Excellent* (additional) for short course of gunnery and torpedo instruction (to date October 22nd).

OFFICIAL.

28, Spring Gardens, S.W.

Royal Naval Reserve (Officers) Regulations.

Article 41.

Add New Clause 2:—

It must be understood that in any case in which an officer proves himself unsatisfactory as regards conduct or capacity, he will be liable to discharge by order of the Admiralty at any time during the voluntary service or 12 months' training.

Inform intending candidates that there is no prospect of any direct commission as lieutenant R.N.R. being granted for

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some time to come, owing to the numbers allowed by Order in Council being almost full.

IT is reported that the winter cruise of the Channel Squadron will include visits to Madeira, Teneriffe, Gibraltar, and up the Mediterranean as far as Port Mahon. Each ship has received six months' stores.

OFFICERS whose names are printed in italics in the Navy List are liable to removal from the list for non-attendance at drill. The following officers' names appear in italics in the last issue of the quarterly Navy List:—Lieuts. Henry Isaac Guy, James Hamilton Fitzgerald Nixon, Sub-Lieuts. George Arthur Hamilton Curtis, Midshipman John Horatio Lindquist.

THE rumour is again abroad that the Duke of York is soon to leave the Navy finally, and receive Army rank. If so, we hope that his Royal Highness will be immediately appointed—as his royal father was before him—a captain in the Royal Naval Reserve. He would make an excellent president at future Reserve dinners, and his appointment, we have every reason to believe, would be hailed with the greatest satisfaction by every officer in that branch of Her Majesty's service.

WE understand that energetic steps are being taken in order to bring the Indian Marine question prominently forward, and we are informed that it is also in contemplation to form a Royal Naval Reserve Club (for the London centre) in connection with an established London club. We hope to be in a position to place the details of both schemes before our readers in our next issue.

Intending guarantors for the cost of printing pamphlet on the Indian Marine question should send in their names (together with pseudonym for use in the pages of this magazine if necessary) *without further delay*. We have already received a number of names, but we should like to see the list as large and representative as possible.

THE Government of India have most wisely decided to disband the corps of Naval Volunteers at Kurrachee, and to form an Artillery Corps in its place. We trust that it will speedily follow suit with the rest. The Calcutta "Navals," it is said, are awakening to the necessity "of forcing upon the

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authorities the recognition of their work and the need for effectively arming the Corps," but as they have declared that their special mission shall be to man a letter of marque, the Government will probably find it convenient to get rid of the would-be buccaneers at the earliest possible moment.

The Army and Navy Gazette has clung to our own "Bottle-washers" until the last; but with the following paragraph on the removal of the *Frolic*, which we extract from our contemporary's pages, we hope it will now—as the newspapers say—"let the matter drop":—

"The scene when the late Volunteers came to take away their boats, which were their own private property, created quite a sensation on the Embankment, owing to the cheering and counter cheering which took place. An amusing incident occurred in connection with a gig owned by Dr. Lyster; he had brought his crew with him, and among them an ex-Volunteer named Tryon, a nephew of Sir George Tryon. When the boat shoved off she at once commenced to fill, owing to the weight of this gentleman in the sternsheets, and before she returned to allow him to get out, was nearly up to her thwarts in the water. The connection between the Chairman of the Committee which recommended the disbandment of the Volunteers, and the man whose weight nearly caused the boat to sink, was seized upon by the ex-Volunteers as a subject for much good humoured chaff."

We are informed that a considerable amount of dissatisfaction exists amongst a number of Reserve officers at the action of the Admiralty in refusing to allow those officers, who are the proud possessors of the "gallantry" medal of the Mercantile Marine Service Association, to wear that decoration when in uniform. Why their lordships have withheld their sanction it would be difficult to imagine, for the "gallantry" medal is not lightly bestowed, nor is it exclusively confined to officers of the Mercantile Marine, for we believe it has been conferred on Naval officers also; but the matter assuredly wants looking into, and we hope that those officers whose request to be allowed to wear the medal has been refused will furnish us with particulars of the Admiralty correspondence. We should like, too, to have the views of Mr. J. J. Grylls—the gentleman who so ably conducts the secretarial business of the Association—on the subject, and perhaps he will be so good as to favour us with them at an early date.

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Up to our time for going to press we have not received any details of the shocking *Bokhara* disaster, but there can be no doubt now as to the loss of her ill-fated commander, Lieutenant Charles D. Sams, R.N.R. He was an officer of much experience, in whom the company had every confidence. He served in the hospital ship *Ganges*, during the naval and military operations in the Eastern Soudan, in 1885, and was gazetted lieutenant in the Royal Naval Reserve in June, 1889. His name appears in the quarterly list of officers authorised to fly the blue ensign, in this issue.

The following notice has just been received for publication regarding the loss of the *Bokhara* :—

"The Superintendent of the Peninsular and Oriental Steam Navigation Company, at Hong Kong, telegraphs to the Managing Directors of the Company, under date of Saturday last, as follows :—'A Board of Trade Inquiry has been held as to the loss of the *Bokhara*, and a decision given that no blame whatever attached to the Commander or officers, and the discipline maintained on board was highly commended.'"

The following passage from an excellently written article in *Truth*, on "The *Times* and Naval Officers," is so much to the point, that we reproduce it for the benefit of those of our readers who may not have seen the article in question :—

"Greater nonsense than the pretence that discipline is in any way threatened by Commander Robinson's movement was never uttered. The only kind of '*noblesse*' about which the public need be troubled is the loyalty of the Service towards the State, or, if you prefer to call it so, the Crown—the honourable resolution of every officer to do his duty to his country in the hour of need, even to the death. But *noblesse* in this shape does not mean that an officer is bound to submit without complaining to any injustice and hardship which his official superiors may lay upon him, and which the public would condemn peremptorily if it understood the facts. It is an insult, therefore, as vile as it is baseless, to suggest that in uttering such a complaint—even though a technical breach of some official regulation were thereby committed—an officer does anything unworthy of his honour or contrary to his duty to the State. On the contrary, he does the State a service, for it is to the paramount interest of the State that its employés should be fairly treated, and that every just ground of complaint in the public service should be removed."

A correspondent directs our attention to the recent appointment of nautical assessors for Admiralty appeal cases

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in the House of Lords, and complains that a slight has been cast upon the Royal Naval Reserve, and indeed on the whole Mercantile Marine Service, by the appointment of Royal Navy officers only, to the entire exclusion of their Mercantile Marine brethren. The list we observe, which is published in the quarterly *Royal Navy List*, contains the names of four vice-admirals, six rear-admirals, and five captains; of these, five are C.B.'s, one a C.M.G., and one an A.D.C. How these gentlemen—many of whom, we understand, have not been employed afloat for years—can be expected to know anything about, say the stowage of a ship's cargo, is a question we leave to the Chamber of Shipping, and one doubtless that will be speedily raised by shipowners and underwriters whose vast interests are so closely affected by these appointments, but we refer to the matter specially now as a striking instance of the loss sustained by Reserve officers by the absence of combined action to safeguard their interests, and of the great need for central committees at Liverpool and London to work in unison towards securing for Reserve officers, not only redress of their existing grievances, but a fair share of the good things going in the way of public appointments.

IT cannot be said that Reserve officers had not timely warning of the appointments to be made in the House of Lords. We received a "tip" from a leading counsel in the Admiralty Court as to what was taking place, and we gave our Reserve subscribers the benefit of it in our May issue. Had there been representative committees in Liverpool and London to take the matter up there and then, and submit their case with a list of eligible officers to the proper authorities, backed up by the interest of the large number of honorary Reserve officers in the House of Lords—who could easily have been moved by deputation or otherwise—we have no hesitation in saying that there would now have been other names on the list of assessors appointed for service in the House of Lords. Perhaps now that Reserve officers have been taught this lesson they will set about combining for their mutual benefit. Our correspondent is wrong in imagining that the Trinity Masters have been "ruthlessly expelled the House of Lords." If he will refer to our May issue he will find the reason why these gentlemen have not been selected to try appeal cases.

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WHILST on the subject of assessorships, we may remind our Reserve friends that the three years for which nautical assessors, appointed to sit in investigations into shipping casualties, expire on the 31st December next, and a new list will be made out by the Secretary of State. The following are the rules regulating these appointments, and the qualifications:—

"(1.) The list of persons approved as assessors for the purpose of formal investigations into shipping casualties shall be in force for three years only, but persons entered in any such list may be approved for any subsequent list. The list of those persons in force at the passing of this Act shall continue in force until the end of the year 1880, but nothing in this section shall affect the power of the Secretary of State to withdraw his approval of any name on any such list or to approve of any additional name."

"QUALIFICATIONS.

"*Class I. Mercantile Marine Masters.*

"(*a.*) Five years' service as a master in the merchant service, of which two years must have been service in command of a sailing-ship with a certificate of competency.

"(*b.*) Five years' service as a master in the merchant service, of which two years must have been service in command of a steamship with a certificate of competency.

"*Class II. Mercantile Marine Engineers.*

"Five years' service as an engineer in the merchant service with a first-class certificate of competency.

"*Class III. Royal Navy.*

"Rank of Admiral or captain and three years' service in command of one of Her Majesty's ships at sea, or rank of staff commander and three years' service in that rank in one of Her Majesty's ships at sea.

"*Class IV. Persons of Nautical, Engineering, or other Special Skill or Knowledge.*

"(*a.*) Such qualification as is, in the opinion of the Secretary of State, requisite for ordinary cases.

"(*b.*) Such qualification as is, in the opinion of the Secretary of State, requisite for special cases."

TOUCHING the above qualifications, we think they might be amended with benefit to the country in more ways than one, by requiring at least one year's service on the active list of the Royal Naval Reserve, in the rank (for Class I.) of lieutenant and (for Class II.) of engineer, such amendment not to affect gentlemen who have already served as such assessors. We do

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not know what guides the Home Secretary in making his selections from the large number of candidates who possess the above qualifications, but there is a feeling gaining ground that the permanent officials at the Home Office have a prejudice against Reserve officers, and it would be well if the Lords Commissioners of the Admiralty and the Board of Trade would look into this matter and exert their powerful influence with the Home Office in obtaining consideration for the claims of officers of the Royal Naval Reserve. There is no use in official grandees and others informing Reserve officers particularly, and the public generally, in after-dinner orations, that the officers of the Reserve are the *élite* of the profession, if, whenever an opportunity occurs of acting on that conviction, they are indifferently brushed aside. Reserve officers who voluntarily give so much of their valuable time for the country's benefit are surely entitled to some consideration in the distribution of the country's rewards represented by the large amount of nautical patronage dispensed by Government officials such as the Secretary of State.

THE "old boys" of the cadet-ship *Conway* stationed in the Mersey, held their annual dinner in Liverpool last month. A number of Naval Reserve officers were present, and the chairman, in proposing the toast of the "Navy, Army, and Auxiliary Forces," remarked that the Royal Naval Reserve was a magnificent branch of the Auxiliary forces, and the fact of its being held in such high esteem in Liverpool was due to a large extent to the number of *Conway* boys who had passed into the service. Captain Crofton, R.N., commanding H.M.S. *Eagle*, drill-ship for the Reserve at Liverpool, in responding for the Navy, said that—

"The Navy owed much to the Mercantile Marine, both as regarded *materiel* and *personnel*. He referred to the splendid vessels which left the port of Liverpool and which, in time of war, would be valuable auxiliaries, and also, too, the officers of the Royal Naval Reserve, many of whom he saw around him. He was very much pleased with the work of the R.N.R. Their training was far above what he had ever thought or expected, and he thought that in time of war they would be a most valuable acquisition to the Royal Navy. It was also a very good thing that the officers of the Mercantile Marine and of the Royal Navy should be drawn together in a way which could only be of benefit to both parties."

Lieutenant Macnab, R.N.R., replied for the Auxiliary Forces.

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A propos, we notice that at the annual meeting of the committee of the *Conway*, held on the 17th October last, presided over by Commander Charles MacIver, R.N.R., it was stated that since its establishment in 1859, 51 boys had passed into the Royal Navy as cadets, and 163 had entered the Royal Naval Reserve as midshipmen.

A NAVAL officer writes as follows to a service contemporary, on the uniform question :—

"I think it is hardly fair to attribute the disregard of the uniform regulations entirely to the officers, for I firmly believe that the majority of officers wish to be strictly in uniform; it is the outfitters who will insist upon departing from the pattern. Take my case, for instance: I wrote for a frock coat and a pair of epaulettes; as I did not specify that they were to be departures from the proper uniform, I consider that they should have been uniform. Some time after their arrival, it was pointed out to me that the frock coat had only one button-hole in the lappell of it instead of two, and that the epaulettes were wire of dead gold instead of being bright. The button-hole I managed on the station, the epaulettes I sent back, and pointed out the great inconvenience I was put to. In reply, my outfitter informed me that he would change the epaulettes, but could not allow me full value on the pair returned, as I had worn them, that the button-holes in the coat, though not in accordance with the instructions, were 'as they are usually made.' This is, I am sure, an example of what frequently happens to officers, and what is generally construed into a want of assisting the Admiralty to obtain a regulation uniform throughout the Service."

A Reserve officer commenting on the foregoing, informs us that he had a similar experience with regard to his cocked hat, which he discovered, after wearing it for a year or two, had the braid arranged on it for the rank of commander, although he was only a lieutenant! He sent it to his outfitter, and received it back with a thick gold cord twisted as for lieutenant, instead of the two braids required by the regulations. He requested an explanation, and was informed by the outfitter that he was supplying all his Reserve customers with the cord instead of the braid, as many of them considered the latter unsightly, and had declined to wear it.

ADMIRAL of the Fleet, Sir Thomas Symonds, in a letter to a service paper criticising an article recently published in the *Times* on the Naval manœuvres, makes some scathing comments on the training, or rather want of training, of our

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Royal Naval Reserves. After demonstrating that our peace strength does not "greatly exceed that of any two other powers," as the writer in the *Times* declared it did; but is, on the contrary, *some* 6,000 *or even* 8,000 *less*, he goes on to say:—

"True, we have a Royal Naval Reserve of 23,501 men; but these men are utterly unaccustomed to ships of war, and are only partly trained, while impressment is at an end, and our seaman class have proved repeatedly that they will not volunteer; notably so was this the case in 1840, when only 600 volunteered in six months, though hostilities were imminent. Our merchant seamen have very many foreigners among them, and our system of manning by boys takes five years to train a thoroughly efficient man."

He points out that the:—

"French have *inscription*, *conscription*, and *recrutement*. Every seaman and fisherman, after twenty years of age, has to serve from three to five years during peace, so as to be a thoroughly trained man when wanted for war. The French *inscrits* amount to 114,512 men. Their conscription will always provide them with *troupes de la marine*. An *Enquête Parlementaire* stated, regarding the French naval *personnel*:—'We may count on 40,000 seamen eminently fit for war, and 20,000 borrowed partly from the *inscription* and partly from *recrutement*—60,000 who are certainly available.'"

The Russian conscription he thinks is pretty sure to produce over 29,000 men, and he has good reason to believe that Russia has also 25,000 men in her Naval Reserve. He winds up his interesting letter by the following weighty observations:—

"Now comes the strangest part of our case. The Government of an island keeps a First Class Army Reserve, which was on January 1st, 1892, 68,421 strong, and a Militia Reserve of 30,171, making a total of 98,592 men, while the Navy has no efficient Reserve. The Army at home and in India costs, it is said, £35,000,000, while the Navy—on which the very existence of our Empire, its commerce, food supply, in fact, everything depends—has been allowed the comparatively small sum of £14,300,000 per annum during the last three years, it having before for years been allowed at the rate of only £10,000,000. *The Navy needs a Reserve of* 50,000 *men and many ships.* And whereas its modern armour-clads will be only thirty-six to France and Russia's sixty-eight, when all are complete, the figures should be reversed. The actual peace seamen class in the French Navy is 40,786 to our 40,007."

There can be no doubt about it that the present system of drilling the men of the Reserve is a very weak spot in our "first line of defence," but until some Member of Parliament

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takes the matter up who is possessed of some portion of the energy and perseverance of the gallant Admiral of the Fleet, we despair of seeing any of the needful reforms effected. Assuredly Admiral of the Fleet, Sir Thomas Symonds, ought to have a seat in the House.

SERVICE CORRESPONDENCE.

LETTERS TO THE EDITOR.

[*The Editor desires it to be distinctly understood that he does not hold himself responsible for the opinions expressed by correspondents.*]

COLOURS FOR THE R.N.R.

SIR,—I entirely agree with your correspondent "F.M.R.C." that distinctive colours should be adopted by the officers of the Royal Naval Reserve, and I am of opinion they should be similar to those worn by the officers of the Royal Navy, but preserving a distinction between the two.

I would suggest, that instead of the dark blue in the tri-coloured ribbon (as worn by the Navy), we adopt light blue in its place; the bands of colour of unequal width and straight, *not "waved"* (as your correspondent suggests).

Instead of the dark blue ribbon, with the naval crown embroidered upon it in red, a light blue ribbon with the naval crown worked in dark blue upon it. Caps, light blue, with the naval crown embroidered in dark blue. On cricket, boating, football, and tennis clothing, if of a dark coloured material, a light blue naval crown; if of light coloured material, dark blue.

These distinctions should not touch the susceptibilities of the most conservative of our naval brethren; there may, perhaps, be a few of the "irreconcilables" (fast dying out) who would grumble at our adopting the naval crown. But if such distinction belongs to the Royal Navy, as a body, and not to individuals, then without entering into a disquisition on the ancient naval history of our country, it must be conceded to that body who in days gone by followed the same calling as we at present do, that they lent a hand to gain that crown for the Navy, and which we (as their successors) have engaged to assist the Royal Navy in retaining for all time.

The best traditions of the Navy and its recorded history are a part and portion of the heritage of everyone who was born under the British Flag; but more especially so are they to those who, as seamen, have thrown in their lot to assist, as

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far as their abilities will allow them, in carrying on its history unimpaired and untarnished to the end.

For weal or for woe, we are a part and a supplemental portion of the Royal Navy; we have voluntarily chosen to adapt ourselves to its regulations, and to implicitly obey its ordinances, and in return we claim a fair portion of the honour, distinction, and reward that such service entails.

The adoption of colours by the Royal Naval Reserve is a matter entirely in the hands of its officers. I would suggest that they consider this subject for themselves, allowing no false delicacy to interfere with their selection. If they can hit upon a better distinction than I have suggested, let their ideas be ventilated in your December issue.

I am, &c.,

Bristol. GEO. CAWLEY, Lieut. R.N.R.

AN R.N.R. NOVELIST.

SIR,—It may be of interest to many of your readers to know that a new novel is in the press, and will be issued shortly, under the euphonious title of "Over the Sea." The author is Lieutenant F. J. Davis, R.N.R., who is well known as the author of "Fifty Sailors' Songs or Chanties," and "Oceanus, or Echoes from Afloat," and who was the winner of the 20 guinea prize in *Tit Bits* for the best article by a sailor, entitled "My Experiences as a Sailor," for which there were no less than 748 competitors. A nautical tale, as told by a sailor, will be looked forward to by sailors of all classes. The book is being published by Messrs. Digby Long & Co. The story is of a highly sensational character, and tells of marvellous adventures and hair-breath escapes by land and by sea, of love and passion, of honour and dishonour, of "men deceivers ever," of woman's faith and frailty, of life afloat, and a sailor's life on shore, and in the Bush of Australia with bushrangers. There is no lack of incident in the book. If "Over the Sea" only pleases the public half as much as Lieutenant Davis's yarn "My Experiences as a Sailor," we may possibly find another sailor dropping the anchor and taking up the pen as a nautical novelist.

I am, &c.,

D. WATSON, Lieutenant R.N.R.

Royal Naval College, Portsmouth,
20th October.

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"*THE TIMES*" AND NAVAL OFFICERS.

SIR,—The *Times* controversy on Naval officers and "a discreditable project" has been the means of disclosing the fact that Commander Charles Napier Robinson, R.N., is the Assistant Editor of the *Army and Navy Gazette*. This, doubtless, is the gentleman to whom we Naval Reserve officers are indebted for the sharp and oftentimes rather unfair criticisms which have appeared, from time to time, on the Reserve in the pages of that journal. I am not now concerned with what Commander Robinson thinks of us—and, indeed, we can afford to be indifferent to the prickings of his pen—but I write to express the feelings of admiration and sympathy I entertain for him in the position he has taken up in connection with the grievances of Naval officers. He has now got his back against the wall, and a man in that position is all the better of a little encouragement. I, therefore, beg to suggest that every Naval Reserve officer who desires to see fair play should convey to him at once by letter an expression of their sympathy, and their support so far as they are able to render any assistance in the way of influencing Members of Parliament or otherwise to enable him to accomplish the objects he has in view. Sir, we junior officers of the Reserve want some public-spirited officer like Commander Robinson to lead us in the struggle we are entering upon to win back our rightful position in Her Majesty's Service. There is a well-grounded dissatisfaction spreading amongst junior officers at the attitude of some of our seniors at the present critical juncture, and who are hanging back at a time when their services are most urgently wanted. He who aspires to be "guide, philosopher, and friend" to his brother officers must be prepared to brave the frowns of high officials when the interests of the service are at stake. We appear to be deserted at this critical moment by those whose ambition in the past has been to shine at social functions as the leaders of the Reserve; but if their talents and ambitions have no higher sphere than that of "master of the ceremonies," we want none of them. That a man of independence like Commander Robinson may speedily step into the breach is the fervent wish of—

Yours truly,

"A JUNIOR LIEUTENANT."

October 22nd, 1892.

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THE ROYAL NAVAL RESERVE AND THE INDIAN MARINE.

SIR,—The officers of the Royal Navy are taking united action with a view to placing their grievances before Parliament, in order to get them redressed in the immediate future.

Now, as you are well aware, it is not the officers of the Royal Navy alone who have the right to feel aggrieved at their treatment by the Admiralty, for we (the officers of the Royal Naval Reserve) may very justly complain of the action of the late Board in granting to the officers of the Indian Marine seniority over us—and that in direct contravention of promises made, and confirmed, in various Orders in Council.

One point in our case, which I do not think has been sufficiently put forward, is, that while officers of the Indian Marine are specially safe-guarded against being employed in any of H.M. ships other than those belonging to the Indian Government, there is nothing in the regulations to prevent our being compelled to serve in their vessels, and it cannot be too strongly impressed upon everyone that in requesting a modification of the Order in Council of March 20th, 1891, we are not asking for anything new, but simply for re-instatement in the position we held for so many years—a position guaranteed to us by Order in Council, and upon the strength of which guarantee the Naval Reserve was formed.

Let us take a leaf out of the book of the Naval officers, and use all legitimate means to bring the question—and the breach of faith involved—before Parliament and the nation.

We give our time—which is our capital—to the State, and we have the right to expect that we shall, at least, be honestly and fairly dealt with.

I am, Sir, &c.,

October 21st, 1892. CLAUDIUS.

NOTICES TO CORRESPONDENTS.

GOODACRE.—The very great advantage of serving in H.M. ships. He is required to perform four weeks' drill each year on board a drill-ship in the United Kingdom, and can volunteer for a short term afloat, or for twelve months' training in the Fleet. Your questions are too general to be answered fully. Apply at a Mercantile Marine office—say, at St. Katherine's Dock House, Tower Hill—where you will get details.

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO OCTOBER 1ST.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	D.S. Bat.-ship, 1st cl.	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Australia ...	12	461	D.S. Cruiser, 1st class	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Camperdown ...	10	...	D.S. Bat.-ship, 1st cl.	... ...	... ...	Portsmouth.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Cleopatra ...	12	283	S. Cruiser, 3rd class	Capt. Hon. Curzon-Howe ...	Sept. 21, 1892, Devonport	N. America and W. Indies.
Collingwood ...	10	420	D.S. Bat.-ship, 1st cl.	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	... ... Malta ...	Mediterranean.
Conqueror ...	6	...	D.S. Bat.-ship, 3rd cl.	Staff C. F. Rowlatt	... ...	Devonport.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Hecla	6	272	Torpedo Depôt-ship	Capt. Durnford, D.S.O. ...	Nov. 6, 1888, Portsmouth	Mediterranean.
Howe	10	523	D.S. Bat.-ship, 1st cl.	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5, '89, Hong Kong	China.
Mercury ...	13	280	D.S. Cruiser, 2nd class	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Narcissus ...	12	467	D.S. Cruiser, 1st class	Capt. J. H. Bainbridge ...	May 4, 1892, Devonport	Channel Squadron.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Pylades ...	14	161	S. Cruiser, 3rd class	Comm. J. B. Young	Re-c. Nov. 13, '89, Bermuda	N. America and W. Indies.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	...	D.S. Bat.-ship, 1st cl.	Capt. Tynte F. Hammill, C.B.	... ...	Channel Squadron.
Sans Pareil ...	15	583	D.S. Bat.-ship, 1st cl.	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	D.S. Cruiser, 2nd class	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Trafalgar ...	10	550	D.S. Bat.-ship, 1st cl.	Capt. G. C. Robinson ... (R.-Ad. A. H. Markham.)	April 2, 1890, Portsmouth	Mediterranean.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.
Victoria ...	15	587	D.S. Bat.-ship, 1st cl.	Capt. Hon. M. A. Bourke ... (V.-Ad. Sir G. Tryon, K.C.B.)	Re-c. Ap. 29, 1890, Malta	Mediterranean.

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QUARTERLY LIST OF THE ROYAL NAVAL RESERVE OFFICERS AND SHIPS AUTHORISED TO FLY THE BLUE ENSIGN. QUARTER ENDED 30TH SEPTEMBER, 1892.

Name and Rank of Officer.		Name and Official Number of Vessel.		Number and Date of last issue of Warrant.	
W. C. Crutchley ...	Lieutenant	*Kaikoura*	89,627	183	10 Feb., 1885
E. J. Griffin	,,	*Moor*	82,428	169	18 Mar., 1886
W. B. Andrews ...	Hon. Lieut.	*Arcadia*	93,172	210	29 Sept., 1888
A. S. Thomson ...	Lieutenant	*Silvertown* ...	68,421	216	4 Mar., 1889
A. McKay	,,	*Janet Cowan* ...	93,219	222	7 June, 1889
W. H. Kidley	Hon. Lieut.	*Ionic*	86,299	225	26 July, 1889
J. Wilson...	Lieutenant	*Ethiopia*	68,064	230	18 Sept., 1889
J. Bone	,,	*Tongariro* ...	76,067	231	30 Sept., 1889
F. S. Land	Hon. Lieut.	*City of Berlin*...	70,913	232	10 Oct., 1889
E. H. T. Freeth ...	Lieutenant	*British Princess*	87,817	234	11 Oct., 1889
R. F. Briscoe	Hon. Lieut.	*Valetta*	87,395	235	14 Oct., 1889
W. R. Cato	,,	*Scotia*	43,711	240	1 Feb., 1890
W. E. White	Lieutenant	*Ormus*	93,341	246	15 May, 1890
C. K. McIntosh ...	,,	*Benalder*	82,011	248	19 May, 1890
R. J. M. Barker ...	,,	*Orion*	96,410	250	10 July, 1890
T. Campbell	,,	*Narva*	88,157	249	30 July, 1890
F. Davies...	,,	*Radnorshire* ...	98,155	251	6 Sept., 1890
C. Stuart	,,	*Inyoni*	98,544	254	27 Oct., 1890
R. Reynolds	,,	*Pretoria*	76,844	186	31 Oct., 1890
D. Stuart...	,,	*Tekoa*	97,473	258	10 Dec., 1890
A. H. H. G. Douglas	,,	*Damascus* ...	94,521	259	13 Dec., 1890
C. H. Kempson ...	,,	*Coptic*	84,164	203	29 May, 1891
E. J. Smith	,,	*Britannic* ...	69,368	221	29 May, 1891
W. H. Moore	,,	*Queensmore* ...	96,394	268	13 June, 1891
R. Barrett	Hon. Lieut.	*Mongolian* ...	98,605	269	4 July, 1891
J. A. Patterson ...	Lieutenant	*Crompton* ...	97,800	271	7 July, 1891
R. W. Padgett ...	Sub.-Lieut.	*Sledmere*	98,723	273	20 Oct., 1891
G. H. Harris	,,	*Cheshire*	99,310	275	4 Sept., 1891
G. W. Banks	,,	*Otarama*	98,081	276	9 Oct., 1891
J. Cuthbert	,,	*Fifeshire*	95,010	278	20 Oct., 1891
J. Templeton	Hon. Lieut.	*Roma*	68,049	279	22 Oct., 1891
J. Cameron	Lieutenant	*Germanic* ...	70,932	280	27 Oct., 1891
W. A. Millar	,,	*Elginshire* ...	98,671	281	3 Nov., 1891
H. G. Thomas ...	,,	*Yarrawonga* ...	99,007	282	11 Nov., 1891
T. Johnson	,,	*India*	85,861	283	1 Dec., 1891
T. J. Jones	Sub.-Lieut.	*Cufic*	93,825	284	16 Dec., 1891
Temperley Darke ...	Lieutenant	*Glenfalloch* ...	68,036	285	31 Dec., 1891
J. Kennedy	,,	*Britannia* ...	89,690	286	10 Feb., 1892
W. C. Haynes... ...	,,	*Belgravia* ...	85,911	289	8 April, 1892
J. C. Dodd	,,	*Manchester* ...	99,391	290	14 April, 1892
W. Easterbrook ...	,,	*Canopus*	63,338	292	16 April, 1892
F. P. Horsfall... ...	Sub.-Lieut.	*Travancore* ...	99,769	293	5 May, 1892
A. W. Clarke	,,	*Orizaba*	93,688	294	5 May, 1892
W. F. Caborne ...	Lieutenant	*Ceylon*	22,173	295	16 May, 1892
P. S. Tomlin	Hon. Lieut.	*Himalaya* ...	99,776	297	30 June, 1892
J. A. Pollexfen ...	,,	*Plassey*	98,125	298	4 July, 1892
J. Campbell	Lieutenant	*Balmoral* ...	99,420	299	12 July, 1892
D. Campbell	,,	*Avoca*	98,663	300	18 July, 1892
C. Sams	,,	*Bokhara*	68,397	302	19 Aug., 1892
G. D. Rutherford ...	,,	*Guy Mannering*	78,580	303	5 Sept., 1892
E. A. Findlay... ...	,,	*Ruapehu*	76,069	304	6 Sept., 1892

The above list is issued by the Admiralty for the information of captains of Her Majesty's ships, with reference to the provisions of Article 85 of the Queen's Regulations, under which they are authorised to ascertain whether British merchant ships flying the Blue Ensign of Her Majesty's Fleet, are legally entitled to do so under the Regulations of the Royal Naval Reserve.

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Royal Naval Reserved Merchant Cruisers.

(These vessels being in receipt of Annual Subvention are permitted to fly the Blue Ensign.)

Name and Rank of Officer.		Name of Vessel.
W. H. P. Hains	Hon. Lieutenant ...	*Etruria.*
H. McKay	,, ...	*Umbria.*
———	———	*Victoria.*
R. G. Murray	Hon. Lieutenant ...	*Britannia.*
———	,, ...	*Oceana.*
F. Watkins	,, ...	*City of Paris.*
———	———	*City of New York.*
P. J. Irving	Lieutenant	*Teutonic.*
H. Parsell	Hon. Lieutenant ...	*Majestic.*
O. P. Marshall	Sub-Lieutenant ...	*Empress of India.*
G. A. Lee	Lieutenant	*Empress of Japan.*
———	———	*Empress of China.*

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TIDE TABLES FOR NOVEMBER, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields.		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown.		Kingstown.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
Th	1	11 2	11 31	3 14	3 43	0 19	0 45	11 40	—	2 11	2 45	7 54	8 20	3 19	3 50	8 18	8 41	8 51	9 18	1 41	2 9	8 3	8 30	5 3	5 23	0 38	1 4
W	2	11 57	—	4 7	4 30	1 8	1 29	0 2	0 24	3 14	3 41	8 44	9 8	4 19	4 46	9 3	9 24	9 42	10 5	2 34	2 58	8 55	9 18	5 43	6 4	1 27	1 49
Th	3	0 19	0 41	4 51	5 12	1 50	2 10	0 45	1 6	4 6	4 29	9 31	9 54	5 11	5 35	9 44	10 5	10 28	10 51	3 21	3 44	9 39	9 59	6 26	6 48	2 10	2 31
F	4	1 2	1 23	5 33	5 55	2 30	2 50	1 27	1 48	4 51	5 13	10 17	10 40	5 59	6 22	10 26	10 48	11 13	11 36	4 6	4 28	10 19	10 39	7 10	7 31	2 52	3 13
S	5	1 48	2 5	6 17	6 39	3 10	3 31	2 9	2 29	5 35	5 57	11 3	11 26	6 45	7 8	11 10	11 32	11 59	—	4 50	5 13	11 0	11 23	7 51	8 11	3 35	3 57
S	6	2 26	2 49	7 1	7 24	3 52	4 15	2 50	3 12	6 19	6 41	11 50	—	7 31	7 53	11 55	—	0 22	0 45	5 57	6 1	11 45	—	8 32	8 54	4 20	4 43
M	7	3 12	3 35	7 47	8 10	4 39	5 3	3 35	3 59	7 3	7 24	0 15	0 40	8 15	8 37	0 18	0 41	1 8	1 31	6 24	6 48	0 8	0 32	9 16	9 39	5 6	5 29
Tu	8	3 56	4 19	8 33	8 57	5 28	5 53	4 23	4 48	7 45	8 6	1 6	1 32	8 59	9 2.	1 5	1 29	1 55	2 19	7 12	7 35	0 57	1 22	10 2	10 26	5 53	6 17
W	9	4 48	5 7	9 22	9 48	6 18	6 44	5 14	5 41	8 27	8 49	1 58	2 24	9 41	10 2	1 53	2 17	2 43	3 7	7 58	8 23	1 48	2 14	10 55	11 20	6 42	7 9
Th	10	5 32	6 1	10 17	10 51	7 14	7 48	6 10	6 43	9 12	9 39	2 50	3 18	10 25	10 53	2 43	3 12	3 32	4 0	8 50	9 19	2 42	3 14	—	0 11	7 39	8 12
F	11	6 31	7 5	11 29	—	8 25	9 7	7 :0	8 0	10 11	10 46	3 48	4 20	11 27	—	3 46	4 24	4 32	5 7	9 52	10 30	3 50	4 29	0 55	1 42	8 47	9 26
S	12	7 40	8 20	0 9	0 49	9 50	10 31	8 42	9 24	11 27	—	4 54	5 30	0 5	0 45	5 7	5 52	5 45	6 25	11 11	11 50	5 9	5 47	2 27	3 7	10 8	10 50
S	13	9 2	9 45	1 28	2 4	11 8	11 42	10 2	10 36	0 9	0 50	6 6	6 41	1 25	2 2	6 33	7 10	7 4	7 40	—	0 26	6 23	6 56	3 41	4 11	11 28	—
M	14	10 22	10 54	2 36	3 6	—	0 12	11 6	11 33	1 28	2 2	7 15	7 45	2 37	3 10	7 43	8 11	8 18	8 43	1 1	1 33	7 27	7 56	4 37	4 58	0 2	0 31
Tu	15	11 24	11 50	3 34	4 0	0 39	1 2	11 56	—	2 32	2 59	8 12	8 34	3 39	4 6	8 34	8 55	9 9	9 32	2 0	2 24	8 21	8 44	5 18	5 36	0 56	1 18
W	16	—	0 12	4 22	4 41	1 22	1 40	0 16	0 34	3 22	3 43	8 55	9 15	4 30	4 52	9 14	9 32	9 53	10 12	2 45	3 6	9 6	9 26	5 54	6 12	1 38	1 57
Th	17	0 32	0 50	4 58	5 15	1 58	2 15	0 52	1 9	4 4	4 23	9 34	9 52	5 13	5 32	9 49	10 6	10 30	10 48	3 25	3 43	9 44	9 59	6 30	6 47	2 15	2 32
F	18	1 7	1 25	5 32	5 49	2 30	2 45	1 26	1 42	4 40	4 57	10 10	10 28	5 51	6 10	10 22	10 38	11 6	11 24	4 0	4 17	10 14	10 29	7 4	7 21	2 48	3 4
S	19	1 41	1 55	6 6	6 23	3 0	3 16	1 58	2 14	5 18	5 29	10 46	11 4	6 28	6 45	10 54	11 10	11 42	mid.	4 34	4 51	10 44	11 0	7 37	7 53	3 20	3 36
S	20	2 11	2 27	6 40	6 57	3 32	3 48	2 30	2 45	5 45	6 1	11 21	11 38	7 2	7 19	11 26	11 42	—	0 17	5 8	5 25	11 16	11 32	8 8	8 23	3 52	4 8
M	21	2 42	2 58	7 13	7 29	4 4	4 20	3 0	3 15	6 17	6 32	11 56	—	7 35	7 51	11 59	—	0 33	0 49	5 42	5 59	11 48	—	8 88	8 53	4 24	4 40
Tu	22	3 18	3 30	7 45	8 1	4 37	4 54	3 32	3 49	6 6	7 1	0 14	0 33	8 7	8 23	0 16	0 33	1 6	1 23	6 16	6 33	0 5	0 23	9 8	9 23	4 56	5 13
W	23	3 48	4 5	8 18	8 36	5 12	5 30	4 7	4 25	7 18	7 35	0 52	1 11	8 39	8 56	0 50	1 7	1 40	1 57	6 50	7 8	0 41	0 59	9 40	9 58	5 30	5 49
Th	24	4 23	4 41	8 55	9 15	5 50	6 11	4 44	5 5	7 52	8 9	1 30	1 51	9 14	9 33	1 25	1 45	2 16	2 36	7 28	7 49	1 19	1 40	10 19	10 44	6 10	6 32
F	25	4 59	5 20	9 37	10 2	6 34	6 59	5 29	5 55	8 27	8 48	2 18	2 36	9 51	10 11	2 6	2 29	2 57	3 19	8 10	8 32	2 3	2 28	11 18	11 46	6 56	7 21
S	26	5 45	6 11	10 30	11 0	7 27	7 58	6 22	6 52	9 13	9 41	3 0	3 26	10 33	10 58	2 54	3 21	3 43	4 9	8 55	9 23	2 54	3 23	—	0 22	7 47	8 16
S	27	6 39	7 10	11 34	—	8 31	9 8	7 26	8 2	10 13	10 50	3 53	4 23	11 29	—	3 51	4 26	4 37	5 9	9 54	10 29	3 56	4 12	1 2	1 44	8 48	9 25
M	28	7 45	8 20	0 11	0 49	9 48	10 27	8 41	9 21	11 30	—	4 53	5 27	0 5	0 42	5 5	5 46	5 45	6 23	11 7	11 44	5 9	5 45	2 26	3 4	10 4	10 44
Tu	29	8 59	9 38	1 25	1 59	11 8	11 35	9 57	10 28	0 13	0 53	6 1	6 33	1 19	1 54	6 27	7 2	6 58	7 32	—	0 18	6 19	6 50	3 37	4 5	11 20	11 51
W	30	10 11	10 48	2 29	2 58	—	0	57	11 28	1 30	2 4	7 4	7 35	2 27	3 0	7 32	8 0	8 3	8 33	0 51	1 23	7 19	7 47	4 38	4 50	—	0 20

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 53	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 21	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 28	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 28	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (*West*)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 8	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 13	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 28	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 18	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 48	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
472	England—Scilly Islands	Buoyage.
473	„ S. Cst.—Exe River	Buoyage.
474	Scotland—Fair Isle	New light.
475	Irish Sea—Isle of Man—Douglas Head	Light altered.
476	Ireland—Cork	Harbour lights.
477	Baltic Entrance—Kiel Bay—Stollen Grund	Light-vessel and fog-signal.
478	Baltic—Oscarshamn—Linsberget	Shoals.
479	„ Gotland—Visby (Wisby)	Harbour lights altered.
480	„ G. of Bothnia—Sidby—Ittergrund Is.	New light.
481	Norway—S. and S.W. Csts.	New lights.
482	„ W. Cst.	New lights.
483	„ N.W. and N. Csts.	New lights.
484	France—Cherbourg	Prohibited anchorage.
485	„ Boulogne—Carnot Breakwater	Occasional lights.
486	„ W. Cst.—Chenal du Tour—Les Platresses	Beacon on N.E. rock.
487	„ „ Belle Ile—Goulfar	New fog-signal.
488	Strait of Gibraltar—Tarifa Light	Sector of Occ. *red*.
489	Mediterranean—Bonifacio Str.—Biscie and Monaci Shoals	Lights altered.
490	„ Adriatic—Veglia—New Besca Bay	Harbour lights.
491	„ Grecian Arch.—Mosko Is.—Aivali Bay	Channel and lights.
492	Red Sea—N. Massawa Chan.—Difnein Is.	Shoal.
493	Madagascar—Befotaka Bay	Shoal.
494	India—W. Cst.—G. of Kutch—Navinar Pt.	New light.
495	Bay of Bengal—Madras	Light to be altered.
496	„ Coringa Bay—Hope Is.	New light (Jan., 1893).
497	China Sea—Banka Is.—Tanjong Ular	Light to be altered.
498	„ Formosa—Port Kok-si	Dangerous bank.
499	Australia—Torres Str.—Proudfoot Shoal	Light-vessel to be withdrawn (Jan., 1893).

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
500	AUSTRALIA—Great Sandy Str.	Certain lights discontinued.
501	,, Blackwood Chan.—Cockburn Reef	Dangerous rock.
502	,, Cape Bowling Green	Decreased depths.
503	,, Keppel Bay—Timandra Bank	Light-ves. withdrawn.
504	,, Port Phillip—Coles and South Chan.	Buoyage altered.
505	SOUTH PACIFIC—Solomon Is.	Various shoals.
506	NORTH AMERICA—Alaska	Various dangers.
507	,, ,, Kadiak Is.—Tugidak Is.	Shoal ground.
508	PACIFIC COAST, U.S. — California — St. George Reef	New light.
509	,, ,, Humboldt	Light altered.
510	WEST INDIES—Puerto Rico—Tuna Pt.	New light.
511	UNITED STATES—Nantucket Sound—Orion and McBlair	Decreased depths.
512	,, Boston Harb. — Scituate and Minot	Dangerous rocks.
513	,, Salem Harb.—Little Haste	Shoal.
514	,, Maine—Machias Bay—Sibby Is.	Fog-signal altered.
515	CANADA—G. St. Lawrence—Cape Magdalen.	New fog-signal.

NAUTICAL NOTICES.

All bearings Magnetic unless otherwise stated.

472.—ENGLAND.—*Scilly Islands.*—*Buoyage.*—The Hats buoy, in Crow sound, has recently been moved one cable W.S.W. from its former position, and now lies in 39 ft. L.W. springs, with the following marks and bearings:—Round island lighthouse, in line with the western hummock on Guther's island N. ¾ W.; the south end of Puffin island, in line with Crow beacon, W.N.W.; Watermill point, S.W. ¼ W., distance 2¼ cables; Hats rock N.E. by N. ¼ N., distance 2½ cables.

473.—ENGLAND.—*South Coast.*—*River Exe.*—*Buoyage.*—The following changes in buoyage have been recently effected:—The Fairway buoy has been marked Exe Fairway. The other buoys have been numbered (not named). Odd numbers are on the starboard hand entering from sea, Nos. 1 to 29; and even numbers on the port hand, Nos. 2 to 12. The starboard hand buoys are black conical, and the port hand buoys are black and white vertical stripes, and can in shape.

A *New Can Buoy*, marked No. 2, painted in black and white vertical stripes, has been substituted for the wreck buoy which has hitherto been on the bar. The buoy lies in 12 ft. L.W. springs, with the following marks and bearings:—The small hummock on hill head just open north of Clerk rock, W. by S. ½ S.; West down coastguard flagstaff open

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twice its height to the southward of the cliff in the foreground, E.N.E. Ely.; Exe Fairway buoy, S.E. ½ S. Sly., distance 4 cables.

A *New Conical Buoy*, marked No. 15, and painted black, has been placed to mark the N.W. shoulder of the Bull Hill bank. The buoy lies in 6 ft. at L.W. springs, with the following marks :—The eighth pier from the north of the railway viaduct at Cockwood, on with the gable end of a white house with a slate roof, on the back land, W. ¼ N.; the east side of Belvedere on with the S.W. corner of Sir J. Duntz's house, N. by W. ½ W.

No. 17, *Black Conical Buoy* (formerly No. 13), has been moved so as to mark the north end of the Bull hill bank; it dries at L.W. springs, and has the following marks :—The south side of Exmouth church tower, in line with the north end of the white buoy store S.E. ½ E.; the flagstaff, Mount Pleasant house, in line with the white boat house on the beach, S.W. ½ S.

No. 27, *Black Conical Buoy* (formerly No. 18), has been moved so as better to mark Powderham reach; it now lies in 4 ft. L.W. springs, with the following marks :—The flagstaff at the end of Starcross pier in line with a clump of trees on the high back land, S.W. by S. ¾ S.; the memorial tower at Lympstone, in line with a yellow painted house on the high back land, S.E. ½ E.

No. 19, *Black and White Vertical Striped Can Buoy*, has been discontinued.

A *Black Conical Buoy*, marked No. 29, has been placed on the east side of the neck channel at the south end; the buoy just dries at L.W. springs, and has the following marks for its position :—The city of Exeter notice post, in line with a railway signal post N.E. ¾ N.; Belvedere, in line with the first large bushy tree north of Powderham church, W. ½ N.; Holman's foundry chimney at Topsham, in line with a large bushy tree on the back land, North.

474.—Scotland.—*Fair Isle.—In the Passage between Orkney and Shetland.—New Light.*—On the 1st of November, 1892, a light will be exhibited from a lighthouse which has been erected on the N.E. end of Fair Isle, on the promontory named the Skroo. It will be a *group Fl. white* light, showing *two flashes in quick succession every thirty seconds*, elevated 262 ft. above H.W. springs; visible about 23 miles, as far round as the island will permit, that is, between the bearings of about E.S.E. ½ E., and N. by E. ½ E. Light is 47 ft. above the ground.

475.—Irish Sea.—*Isle of Man.—Douglas Head Light.—Alteration of Character.*—On and after 1st November, 1892, it is intended to alter the character and increase the power of Douglas head-light. The present *F. white* light will be *discontinued* and the new light exhibited. The character of the new light will be *white*, and show a number of *flashes* (6) *in quick succession* during a period of about 15 seconds, followed by a period of darkness of about 15 seconds. The light will be visible as far round as the land will permit.

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476.—IRELAND.—*South Coast.—Port of Cork.—Additional Harbour Lights.*—(1.) On November 5th, 1892, two *F. white* lights will be exhibited at Monkstown, west side of river Lee. One at the north end of Monkstown pier, the other on the wall of the public road, in a N. ¼ W. direction. These lights in line bearing N. ¼ W. will lead clear of the shoal extending off Black point, and in mid-channel towards Monkstown. (2.) Two *F. white* lights will be exhibited on Marino point, east side of the river Lee, which in line bearing S.E. ½ E. will lead in mid-channel from off Merino point to a position about 2¼ cables below Lough Mahon lighthouse. (3.) A *F. green* light will be exhibited from a mast erected on the south side of the railway, about 345 yards west of Dunkettle bridge, on the north side of river Lee. This light in line with Dunkettle light bearing N.N.W. ¼ W. will lead in the fairway from Lough Mahon lighthouse to the buoy off Oliver point. *Variation*, 22° *W.*

477.—BALTIC ENTRANCE.—*German Coast.—Kiel Bay.—Kiel Fiord Approach.—Light-Vessel with Fog-Signal Eastward of Stoller Grund.*—The light exhibited from Stoller grund light-vessel is a *double Fl. half minute white* light, showing *two flashes*, each of about *two seconds'* duration, separated by an eclipse of about *six seconds*, and followed by an eclipse of about *twenty seconds*. Elevated 86 ft. above the sea, and visible 11 miles. The light-vessel, painted red, with the name *Stoller grund* in white letters on her sides, carries a black frame ball at the masthead; she has also a movable jigger mast. Approx. position, lat. 54° 30′ 20″ N., long. 10° 17′ E.; with Bülk point lighthouse bearing S.W. by W., distant $4\frac{2}{10}$ miles. *Variation*, 12° *W.* The fog-signal is a siren, which will give two blasts (high, low), each of *two seconds'* duration, separated by an interval of *five seconds*, and followed by an interval of about *thirty seconds*.

Note.—Vessels seen standing into danger, will be warned by successive short blasts of siren, by sounding the bell, and by flag-signals.

478.—BALTIC.—*Swedish Coast.—Oscarshamn Approach.—Shoals N.E. of Liusberget.*—Lying in the fairway of approach to Oscarshamn from the S.E.:—(1.) A shoal (*Fido shoal*), on which the British steam-vessel *Fido* struck, with 15 ft. water on it, lies with Liusberget beacon bearing S.W. by W., distant one cable. (2.) A shoal, with 3¼ fathoms water on it, lies with Liusberget beacon bearing S.W. by W., distant 1¼ cable. A black and white beacon will be placed on the north side of this danger. Approx. position, lat. 57° 16′ 15″ N., long. 16° 31′ E. *Variation*, 8° *W.*

Note.—The track on the plan of Oscarshamn heretofore shown as passing between these now reported shoals, has been shifted to the northward, and so clearing them.

479.—BALTIC.—*Sweden.—Gotland.—West Coast.—Visby.—Alterations in Harbour Light.*—Visby (Wisby) harbour light (on the south end of breakwater) is a *Fl. white* light, elevated 24 ft. above the sea, and visible about 7 miles. A reflected light is shown from the upper

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part of the lighthouse over the harbour pier. Ill. app. dioptric of 6th order. Lighthouse, gray, stands on a concrete base. Approx. position, lat. 57° 38′ 25″ N., long. 18° 17′ 15″ E.

480.—Baltic.—*Gulf of Bothnia.—Russian Coast.—Sidby Approach.—Light on Ittergrund Islet.*—This light is *F. white*, visible from the bearing of N. 18° W., through north and east, to S. 6 W.; elevated 143 ft. above the sea, and seen about 18 miles. This light is provided with two dioptric apparatuses of the 2nd order, the lower of which is only lighted during thick or foggy weather, in order to intensify the light. Lighthouse, 134 ft. high, of iron, and circular, stands on a granite base (about 5 ft. high), the lower two-thirds of the tower are painted white, the upper third is red; the lantern is red with white cupola. Approx. position, lat. 61° 59′ 5″ N., long. 21° 18′ 5″ E. *Variation*, 5° *W.*

481.—Norway.—*South and S.W. Coasts.*—(1.) *Light at Imsa.*—Imsa light, shown from the S.E. coast of Imsa (Imsö) is an *Occ.* light, showing *white* from the bearing of S. 75° W. to N. 48° W.; *red* from N. 43° W. to N. 39° W. over Tvistenen; *white* from N. 35° W. to N. 21° W. (leading eastward of Vaarene); is obscured from N. 21° W. to N. 31° E.; shows *white* from N. 31° E. (leading westward of Vaarene, Svartskjœrêne, and Smellen) to N. 41° E.; *red* from N. 41° E. to N. 75° E., over Lomgeboerne, Klippeskjærene, Hellerene, and Flaget; *white* from N. 75° E. to S. 89° E.; and is again obscured from S. 89° E. to S. 75° W.; elevated 100 ft. above H.W. (10 ft. above the ground), and visible 6 miles. Exhibited throughout the year. Approx. position, lat. 58° 1′ 40″ N., long. 7° 11′ 35″ E. *Variation*, 14° *W.*

(2.) *Light at Kirkehavn.*—Kirkehavn light, shown from the north side of entrance to Kirkehavn, west side of Hitterö, is an *Alt. red and white* light, visible from the westward through Havsund; elevated 15 ft. above H.W. (10 ft. above the ground), and seen 6 miles. Exhibited throughout the year. Approx. position, lat. 58° 14′ 5″ N., long. 6° 31′ 50″ E.

(3.) *Light on Hansaskjær.*—Hansaskjær light, on the west side of Osnesgavlen, is an *Alt. red and white* light, visible from the bearing of S. 24° W. to S. 55° W.; is obscured from S. 55° W. to N. 30° E.; visible from N. 30° E. to N. 49° E. (leading eastward of Skorpa); is obscured from N. 49° E. to S. 60° E.; visible from S. 60° E. (leading northward of Kvalataaen) to S. 36° E. (leading southward of Fladskjærene); and is again obscured from S. 36° E. to S. 24° W.; elevated 18 ft. above H.W. (10 ft. above the ground), and seen 6 miles. Exhibited annually from 15th July to 15th May. Approx. position, lat. 59° 23′ 50″ N., long. 5° 12′ 55″ E. *Variation*, 15° *W.*

482.—Norway.—*West Coast.*—(1.) *Light on Röværsholmen.*—This is an *Occ.* light of 3rd order, with *five short eclipses* in succession *every minute*, and showing *white* from the bearing of N. 58° W. to S. 65° W. (leading southward of Ramsholmerne); *red* from S. 65° W. to S. 2° W.; *white* from S. 2° W. (leading westward of Bömmelbaaden) to N. 64° E. (leading northward to Nordboen); *red* from N. 64° E. to N. 11° E.

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(leading westward of Bjorkeværgrunden); and from N. 11° E. to N. 58° W. it is obscured. Visible 13 miles; will be exhibited throughout the year. Lighthouse, of iron, is painted red. Approx. position, lat. 59° 27′ N., long. 5° 4′ 30″ E. *Variation*, 15° *W.*

(2.) *Light on Holmengraa.*—This is a *F.* light of 3rd order, showing *white* from the bearing of N. 20° W. (leading eastward of Feiö) to N. 68° W.; *red* from N. 68° W. (leading southward of Mefjordboen or Mefjorden) to S. 32° W. (leading westward of Ytre Kraakeflua); *white* from S. 32° W. to N. 42° E.; and from N. 42° E. to N. 20° W. it is obscured. Is elevated 105 ft. above the sea, and visible 13 miles; exhibited annually from 15th July to 1st June. Lighthouse, 41 ft. high, a white wooden structure. Approx. position, lat. 60° 50′ 35″ N., long. 4° 39′ 25″ E.

(3.) *Alterations in Ronglevær Light.*—This is now an *Alt. red and white* light, visible from the bearing of S. 7° W. (leading eastward of Hestholmen), to S. 36° W., also from N. 20° E. (leading clear of the shoals eastward of Lyngoksen or Lyngoxen) to N. 11° W.; in other directions it is obscured, in both sectors also it is partially masked by the adjacent islets. Elevated 29 ft. above the sea, and seen 6 miles. Lighthouse, 11 ft. high, a white wooden structure. Approx. position, lat. 60° 48′ 20″ N.; long. 4° 48′ E. *Variation*, 16° *W.* Not constantly attended to; will be exhibited annually from 15th July to 15th May.

483.—Norway.—*N.W. and North Coasts.*—(1.) *Hassel Fiord.*—*Light on Svinöen.*—The light on Svinöen, approach to Melbö (Melbu), north side of Hassel fiord, is an *Alt. red and white* light, visible from the bearing of N. 81° W. (leading southward of Vasvikskjærfhaen) through north to S. 86° E. (leading southward of Hougnœs (Haugnes) and shoals off it); in other directions it is obscured, and it is also partially masked by Hougkleppene (Haugklepperne) between N. 76° E. and N. 80° E.; elevated 35 ft. above H.W. (19 ft. above the ground), and seen 6 miles. Exhibited annually from 15th August to 30th April. Approx. position, lat. 68° 29′ 35″ N., long. 14° 49′ 35″ E. *Variation*, 11° *W.*

(2.) *Tiel Sund.*—*Light at Balstad.*—The light at Balstad (Balstadströmmen), north side of Tiel sund (Tjeldsund), is an *Occ. white* light, visible from the bearing of S. 85° W., through north, to S. 89° E.; elevated 13 ft. above H.W. (10 ft. above the ground), and seen 6 miles. Exhibited annually from 1st September to 14th April. Approx. position, lat. 68° 33′ 35″ N., long. 16° 20′ 20″ E. *Variation*, 9° *W.*

(3.) *And Fiord.*—*Light on Holmen.*—The light on Holmen (Holmenvær), east shore of And fiord, is a *F. white* light, visible in all directions except through a small arc to the eastward towards Grundfarnesset; elevated 75 ft. above H.W. (10 ft. above the ground), and seen 6 miles. Exhibited annually from 1st September to 14th April. Approx. position, lat. 69° 17′ 40″ N., long. 16° 48′ 30″ E.

(4.) *Sörö Sund.*—*Light on Vatn.*—The light on Vatn (Vatnholmen), north shore of Sörö sund, is a *F. white* light, visible from the bearing of

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S. 46° W., through north, to N. 78° E.; elevated 39 ft. above H.W. (10 ft. above the ground), and seen 8 miles. Exhibited annually from 1st September to 14th April. Approx. position, lat. 70° 31′ 30″ N., long. 22° 56′ 30″ E. *Variation*, 8° *W.*

(5.) *Vardö Bay.—Light on Steil Ness.*—An *Alt. red and white* light (not constantly attended to) is exhibited on Steil ness (Stegelnæs), west side of entrance to Vardö bay. It is visible from the bearing of N. 88° E., through north, to S. 88° W.; elevated 26 ft. above H.W. (10 ft. above the ground), and seen 6 miles. Exhibited annually from 1st September to 14th April. Approx. position, lat. 70° 21¼′ N., long. 31° 7′ E. *Variation*, 2° *E.*

484.—France.—*North Coast.—Port de Cherbourg.—Prohibited Anchorage.*—Anchorage is prohibited within a certain area in the eastern part of port de Cherbourg, and which is defined as follows.—On the west by an imaginary line joining fort des Flamands and fort de l'Est on the breakwater; on the east by a line nearly parallel to the foregoing, and connecting Ile Pelée and the east angle of port des Flamands; on the north by a line drawn from fort Central on the breakwater to Happetout tower; and on the south by the coast between fort des Flamands and the east angle of port des Flamands.

485.—France.—*North Coast.—Boulogne.—Carnot Breakwater Works.—Occasional Lighting.*—These breakwater works are occasionally lighted by torches and lanterns, but principally by a lamp with a flame of great volume. They may be shown from any part of the breakwater, but generally from the inshore portion.

486.—France.—*West Coast.—Chenal du Four.—Les Platresses.—Beacon on N.E. Rock.*—A beacon, constructed of masonry, has been erected on the N.E. rock of Les Platresses, west shore of Chenal du Four. The beacon is 39 feet in height above the rock. Approx. position, lat. 48° 26′ 20″ N., long. 4° 50′ 55″ W.

487.—France.—*West Coast.—Belle Ile.—Fog-Signal S.W. of Goulfar Lighthouse.*—With reference to previous notice: Siren established in a small structure of masonry, erected on the summit of the cliff, and situated about 1,420 yards S. 47° W. from Goulfar lighthouse, west coast of Belle Ile: will give at intervals of about *two minutes*, two consecutive blasts of equal power and of *three seconds'* duration each, separated by silence of *three seconds*. Approx. position, lat. 47° 18′ 10″ N., long. 3° 14′ W. *Variation*, 17° *W.*

488.—Strait of Gibraltar.—*Spanish Coast.—Tarifa Lighthouse.—Sector of Occ. Red Light.*—A sector of *Occ. red* light is now shown from Tarifa lighthouse through an arc of about 22° over Cabezos shoals, the axis of the arc indicating the centre of the shoals. Through this arc the light will be occulted *every five seconds*. Approx. position, lat. 36° 0′ N., long. 5° 36¾′ W.: further notice will give the bearings.

489.—Mediterranean.—*Bonifacio Strait.—Alterations in Ca[illegible] and Razzoli Island Lights.*—To indicate the vicinity of Bi[illegible]

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Monaci shoals, the following alterations will be made :— (1.) A *F. red* light (dioptric), visible 5 miles, will be exhibited from a window of cape Ferro lighthouse, 31 ft. below the existing light; visible through an arc of 33°, or from the bearing of S. 4° W. to S. 37° W. The eastern limit of this light will lead about 2 cables eastward of Biscie shoal, and the western limit about 2 cables westward of Monaci islets. Approx. position, lat. 41° 9¼′ N., long. 9° 31½′ E. (2.) Razzoli island light (*F. white* with *red* sector) will be obscured through an arc of 90°, or from the bearing of N. 57° W. to N. 33° E. The N.E. limit of this obscured arc will lead about 1¼ mile northward of Monaci shoal, and the western limit about 5 cables westward of Spargiotto islet. Approx. position, lat. 41° 18½′ N., long. 9° 20¼′ E. *Variation*, 11° *W.*

Note.—In order to avoid Biscie and Monaci shoals, the *red* light of cape Ferro must not be sighted unless Razzoli light is visible.

490.—MEDITERRANEAN.—*Adriatic.—East Shore.—Veglia Island.—New Besca Bay.—Harbour Lights.*—The mole in New Besca (Bescanuova) bay being completed, a light is now exhibited from an iron support above a small red structure erected on the mole head, and about 25 ft. within its extremity. It is a *F. green* light (dioptric), visible from the bearing of N. 73° W., through north, to S. 81° E.; elevated 33 ft. above the sea (29 ft. above the ground), and seen 5 miles. Approx. position, lat. 44° 58′ N., long. 14° 46′ E. *Variation*, 9° *W.* Cricin point light, on the east side of New Besca bay, is discontinued.

491.—MEDITERRANEAN.—*Grecian Archipelago.—Mosko Islands.—Aivali Bay.—Entrance Channels, Lights*, &c.—The north entrance, between Mosko and Krommido islands, is a narrow channel, with a least depth of 2 fathoms, and marked by three beacons and four buoys. The outer beacon is placed on the small islet on the north side of the entrance, the two inner beacons are placed on either side of nearly the narrowest part of the channel, and just within two piers that extend a short distance from each island. Two buoys are moored near the outer entrance, and two near the inner entrance. The fairway lies between the buoys and the two inner beacons. The west entrance, between Mosko island and the mainland, is a dredged channel, about one mile in length, and one-fifth of a cable broad, with depths of 3 to 3½ fathoms. It is marked on either side by beacons, from which lights are shown at night, and by buoys. The outer beacon, from which is exhibited a *red* light, stands insulated on the south edge of the shoal ground on the north side of the entrance. The other beacons are arranged in pairs, three with *red* lights on the north side of the channel, and three with *white* lights on the south side. The buoys on the north side are also red, those on the south side white. The fairway lies between the two rows of light beacons and buoys.

Note.—The town of Aivali, on the east side of the bay, contains 300,000 inhabitants, many factories, &c., and is of increasing importance.

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492.—Red Sea.—*Western Shore.—North Massawa Channel Approach. —Shoal Reported N.W. of Difnein Island.*—British s.s. *Akbar* reports, that when approaching North Massawa channel from the northward on 1st July, 1892, the ship, drawing nearly 20 ft. water, touched slightly at 8 p.m. on a shoal (probably composed of coral) lying with Difnein island bearing about S.S.E. ½ E., distant 12 miles. A sounding of 5 fathoms was obtained near the spot, and soon after the ship was anchored in 22 fathoms. The weather at the time was hazy, and there was a slight swell from the southward. Position, as given, to be considered very doubtful, lat. 16° 47′ N., long. 39° 12′ E. *Variation*, 4° *W.*

Caution.—There being many indications of shoal patches northward of Difnein, and the area being but imperfectly examined, caution is necessary in approaching that island.

493.—Madagascar.—*North Coast.—Befotaka Bay.—Shoal on West Shore.*—Commander of the *Sagittaire* reports the existence of a shoal, locally known as *Andriva Rangotro*, lying on the west shore of Befotaka bay; it is about one mile long in an east and west direction and half-a-mile broad; there are several patches on it with less than 3 ft. water on them, and from the depth of 10 ft. near the edges the water quickly deepens to 10 and 11 fathoms; one head, near the centre of the shoal, is awash at L.W. Approx. position of centre, lat. 12° 26′ 30″ S., long. 48° 54′ E.

494.—India.—*West Coast.—Gulf of Kutch.—Light on Navinar Point.*—It is a *F. white* light, visible from the bearing of E.N.E., through north to W.S.W.; elevated 50 ft. above H.W., and seen 13 miles. Ill. app. catadioptric of 4th order. Lighthouse, of stone, whitewashed. Approx. position, lat. 22° 44′ 30″ N., long. 69° 42′ E. *Variation*, 1° *E.*

495.—Bay of Bengal.—*Coromandel Coast.—Madras Light.—Intended Alteration in Character and in Position.*—It is shortly intended to make the following alteration in the character and in the position of Madras light:—Madras new light will be a *double Fl. white* light *every half minute*; the ill. app. will be dioptric of 3rd order; will be shown from the main tower of the new High Court buildings. Approx. position, lat. 13° 5′ N., long. 80° 17¼′ E. Further notice will be given.

496.—Bay of Bengal.—*Coromandel Coast.—Coringa Bay.—Hope Island Light.—Intended Alterations, and Temporary Discontinuance.*—With reference to Notice 448, p. 964, it is expected the new light will be ready for exhibition on 1st January, 1893:—Hope island new light will be *F. white*, visible through an arc of 180°, through 40° of which a sector of *red* light will be shown in the direction of Sacramento shoal: should be seen in all directions seaward 14 miles. Ill. app. dioptric of 4th order. Approx. position, lat. 16° 49′ N., long. 82° 19′ E.

497.—China Sea.—*Banka Strait.—Banka Island.—Tanjong Ular Light.—Intended Alteration in Character.*—During the first half of the

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month of December, 1892, the following alteration will be made:—Tanjong Ular light will be *Fl. white* of 4th order, showing flashes *every half minute*. Approx. position, lat. 1° 57½′ S., long. 105° 7¾′ E.

Note.—During the time this alteration is being effected, no light will be shown for several nights. Further particulars will be published.

498.—China Sea.—*Formosa.—West Coast.—Dangerous Bank Reported off Port Kok Si.*—Bank lies about three miles from the nearest shore, and with fort Zelandia bearing S.E. by E., distant about 12 miles. The bank, composed of sand and occasional boulders, has 7 ft. on it at L.W. Approx. position, lat. 23° 7′ N., long. 119° 59½′ E. *Variation*, ½° *W.*

499.—Australia.—*North Coast.—Torres Strait Approach.—Proudfoot Shoal Light-Vessel.—Intended Withdrawal.*—On 14th January, 1893, Proudfoot shoal light-vessel will be withdrawn from her station in the western approach to Torres strait, and not replaced. Approx. position, lat. 10° 32½′ S., long. 141° 28½′ E.

Caution.—As the withdrawal of this light-vessel will leave the dangerous Proudfoot shoal unmarked, care should be taken in approaching *Booby* island from the westward, to keep well to the southward.

500.—Australia.—*East Coast.—Great Sandy Strait.—Discontinuance of Certain Lights.*—The lights between Snout point and the Junction buoy (near Mary river entrance), in the southern portion of Great Sandy strait, are discontinued.

501.—Australia.—*East Coast.—Blackwood Channel.—North Channel.—Dangerous Sunken Rock Eastward of Cockburn Reef.*—Mr. Inman, coast pilot, reports the existence of a dangerous rock (*Inman rock*), of small extent, with an estimated depth of 6 ft. on it at L.W. springs, lying about one mile southward of the course recommended through North channel, with the north-western of Sir Charles Hardy islands bearing approximately S.S.W., and the northern of the Cockburn islands W. by S. Position, to be considered doubtful, lat. 11° 49′ S., long. 143° 28′ 40″ E. *Variation*, 5° *E.*

502.—Australia.—*East Coast.—Decreased Depths on Shoal off Cape Bowling Green.*—The north extreme of the shoal lying about 8½ miles eastward of cape Bowling Green has less than 2 fathoms water on it. There are two separate patches, with 7 to 10 fathoms water between them, and about 18 ft. over the easternmost one. Approx. position, lat. 19° 19′ S., long. 147° 29½′ *E.*

503.—Australia.—*East Coast.—Kepple Bay.—Timandra Bank Light-Vessel Withdrawn.*—This light-vessel, south shore of Kepple bay, is withdrawn and will not be replaced; in order to facilitate entering Fitzroy river at night, the following lights are improved, viz:—The leading light on cape Capricorn, Balaclava island leading lights, and Sea Hill light. A *F. white* light of small power is also shown from the Pilot station, visible from the bearing of S.E. ¼ S. (including the position of Timandra bank buoy) to E. ¼ S. Approx. position, lat. 23° 27½′ S., long. 151° 1½′ E. *Variation*, 8° *E.*

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504.—AUSTRALIA.—*South Coast.—Port Phillip Entrance.—Coles and South Channels.—Alterations in Buoyage.*—(1.) *Coles Channel.*—The existing North, South, and Wreck buoys will be withdrawn, and in lieu thereof three *conical* buoys, painted red, will be moored as follows:—North buoy in 18 ft. water, on N.W. edge of West sand, with Pile lighthouse, West channel, bearing E. ¾ S., distant $1\frac{5}{10}$ mile, and high lighthouse, Queenscliff, S.S.W. Middle buoy in 20 ft. water, on west edge of West sand, with Pile lighthouse, West channel, bearing N.E. ¾ E., and South Red bluff beacon N. by W., distant $1\frac{5}{10}$ mile. South buoy in 18 ft. water, on S.W. edge of West sand, with Pile lighthouse, West channel, bearing N.E. by N., and north extreme of Duck island N.W. by W. ¾ W., distant $1\frac{5}{10}$ mile.

(2.) *South Channel.*—The green light now shown from No. 15 black buoy, at east end of Middle ground, will be discontinued, and in lieu thereof an *Occ. white* light, occulted *eight times every minute*, will be exhibited. *Variation*, 8° *E.*

505.—SOUTH PACIFIC.—*Solomon Islands.*—(1.) *Shoals in Maramasike Passage.*—A shoal, with a depth of 3 fathoms, extends about one mile W. by S. from Sail rock; approx. position, lat. 9° 15′ S., long. 161° 14′ E. A shoal, with 4 fathoms water on it, lies with Bushman inlet bearing W. ¼ N., distant about 1¼ mile; approx. position, lat. 9° 20½′ S., long. 161° 14′ E.

(2.) *Shoal Eastward of Vella Lavella Island.*—A shoal, with 5 fathoms or less water on it, the bottom being distinctly seen, lies about 1¼ mile eastward of Vella Lavella island, in approximate lat. 7° 52′ S., long. 156° 42′ E.

Note.—It is considered that this shoal may be identical with, or an extension of, the shoal charted as lying about 2 miles S.W. of the above position.

(3.) *Shoal in Lengo Channel.*—A shoal, with apparently 4 fathoms water on it, lies in the fairway of Lengo channel, with Pari Sule bearing N. 65° E., distant about 5¼ miles. Approx. position, lat. 9° 17′ S., long. 160° 13′ E.

(4.) *Shoal Southward of Gizo Island.*—A shoal, with an estimated depth of 6 fathoms, and on which the sea broke (there being a heavy swell at the time), lies with the east extreme of Gizo island bearing North, distant 8½ miles. Approx. position, lat. 8° 9′ S., long. 156° 49′ E. *Variation*, 8° *E.*

506.—NORTH AMERICA.—*Alaska.—Information Concerning Certain Dangers.*—Report made by the master of the whaling barque *Northern Light:*—(1.) Sea Otter reef or bank, about 2 miles in extent in an east and west direction, and awash at L.W., is estimated, by bearings and observations of the sun, to lie with the north point of Middleton island bearing S. by E. ⅞ E., distant 19 miles, or about 8 miles west of the charted position. Approx. position, lat. 59° 49½′ N., long. 146° 18′ W. At the distance of 6 to 8 miles eastward of Sea Otter reef, an overfall or

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breaker was observed, indicating the existence of a shoal lying in approximately lat. 59° 49′ N., long. 145° 55′ W. (2.) The *Northern Light* struck heavily on a rock, not shown on the chart, lying with the S.E. point of Middleton island bearing N.N.W. ¼ W., distant nearly 4 miles. Approx. position, lat. 59° 21′ N., long. 146° 16′ W. *Variation*, 26° *E.* (3.) The charted position of Pamplona bank (lat. 59° 34′ N., long. 148° 0′ W.) was passed over several times without any indications of shoal water being seen. This bank will still be retained on the Admiralty charts.

507.—North America.—*Alaska.—Kadiak Island.—Shoal Ground South and West of Tugidak Island.*—Numerous statements tend to show that shoal ground exists for the distance of about 10 miles in a south-westward from Tugidak island:—A dangerous sunken rock, with 2 fathoms water on it, lies with the south end of Tugidak island bearing N. ¼ E., distant about 4¼ miles; no indications of broken or discoloured water were seen within a distance of 3 miles inshore of it. Approx. position, lat. 56° 20′ N., long. 154° 42′ W. *Variation*, 23° *E.* A dangerous rock lies with the south end of Tugidak island bearing east, distant at least 7 miles, or in approximately lat. 56° 27′ N., long. 154° 50′ W.

508.—Pacific Coast, U.S.—*California.—St. George Reef.—Light on N.W. Seal Rock.*—This light, of 1st order, will show *red and white flashes*, alternately, at intervals of *fifteen seconds:* elevated 145 ft. above H.W., and visible 18 miles. Lighthouse, 66 ft. high, a square pyramidal granite tower, rising above the east end of an oval masonry pier, with black lantern. The fog-signal apparatus is placed within the pier. Approx. position, lat. 41° 50′ 10″ N., long. 124° 22′ 45″ W.

Note.—The steam fog-whistle on St. George reef gives blasts of *five seconds'* duration, separated by silent intervals of *thirty-five seconds*, not every thirty-five seconds as heretofore stated.

509.—Pacific Coast, U.S.—*California.—Alterations in Humboldt Light.*—Lighthouse recently erected on Table bluff, about 5 miles S. by W. from its present position on the north side of Humboldt bay entrance. It is a *F. white* light of 4th order (as at present); elevated 178 ft. above H.W., and visible 17 miles. Lighthouse, 30 ft. high, consists of a square wooden tower, painted white, with black lantern, and keeper's dwelling, also white, attached. A second white dwelling stands near the tower, and the fog-signal station is between the dwellings. Approx. position, lat. 40° 41′ 35″ N., long. 124° 16′ 25″ W. *Variation* 19°. *E.*

Note.—The steam fog-whistle also moved from Humboldt bay to Table bluff, will give blasts of *four* and *eight seconds'* duration, alternately, separated by intervals of *twenty-four seconds*, not every twenty-four seconds as hitherto stated.

510.—West Indies.—*Puerto Rico.—S.E. Coast.—F. Light on Tuna Point.*—Will be a *white* light, with *two white flashes* every *two minutes*, elevated 123 ft. above the sea, and visible 18 miles. Ill. app. catadioptric of 3rd order. Lighthouse, 53 ft. high, an octagonal tower,

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painted white, rising above a rectangular gray building. Approx. position, lat. 18° 1¼′ N., long. 65° 51′ W.

511.—UNITED STATES.—*Nantucket Sound.—Eastern Entrance.—Decreased Depths between Orion and McBlair Shoals.*—A recent survey shows numerous spots heretofore uncharted, with 3¾ to 5 fathoms water on them, while a shoal of small extent, with 18 ft. water on it, lies with Great Round shoal light-vessel bearing W. ⅝ S., distant about 6 $\frac{1}{10}$ miles, or in approximately lat. 41° 26′ 20″ N., long. 69° 46′ 50″ W. Between this shoal and Orion shoal buoy the spots above-mentioned generally lie.

Note.—A depth of not less than 7 fathoms may be carried by passing just northward of McBlair shoal, keeping Great Round shoal light-vessel on a W. ¼ N. bearing. *Variation*, 11° *W.*

512.—UNITED STATES.—*Massachusetts.—Boston Harbour Approach.—Dangerous Sunken Rocks off Scituate and Minot Ledge.*—(1.) A depth of 14 ft. over rock was found on the shoal (*Tar Pouch*) situated about one mile N.E. of Scituate. This rock lies close to the position where 3¾ fathoms has hitherto been shown, with Scituate tower bearing S.W. ⅜ S., distant nearly one mile. Approx. position, lat 42° 13′ 10″ N., long. 70° 42′ 20″ W. (2.) A pinnacle rock, with 21 ft. on it, and deep water around, lies with Minot ledge lighthouse bearing W. ⅜ N., distant about 2 $\frac{4}{10}$ miles. Approx. position, lat. 42° 16′ 25″ N., long. 70° 42′ 20″ W. *Variation*, 13° *W.* The depths given are at L.W. springs.

513.—UNITED STATES.—*Massachusetts.—Salem Harbour Entrance.—Shoal Northward of Little Haste.*—A shoal, small in extent, with a least depth of 17 ft. over it, lies in Salem harbour entrance, with Little Haste beacon bearing S. ¾ E., distant 3 cables. *Variation*, 13° *W.*

514.—UNITED STATES.—*Maine.—Machias Bay Entrance.—Libby Island Lighthouse.—Alteration in Character of Fog-Signal.*—Libby island fog-whistle now gives blasts of *four seconds'* duration, separated by alternate silent intervals of *four* and *eighteen seconds*. Approx. position, lat. 44° 34′ N., long. 67° 22¼′ W.

515.—CANADA.—*Gulf of St. Lawrence.—South Shore.—Fog-Signal at Cape Magdalen Lighthouse.*—This fog-signal is a steam whistle, which gives blasts of *eight seconds'* duration, with intervals of *twenty-two seconds* between the blasts. Elevated about 128 ft. above H.W. Fog-signal building, constructed of wood and painted white (roof brown), is situated on top of the cliff in front of the lighthouse. Approx. position, lat. 49° 15½′ N., long. 65° 19¼′ W.

PHILIPPINES.—LUZON ISLAND.—MANILA.

Alterations in Storm-Signals and Freshet Signal.—The following alterations have been made in the storm-signals shown from the Semaphore and Harbour office at Manila; also a freshet signal has been established. During the day the signals are made by means of a *drum*,

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cone, *ball*, and *flag;* and at night by *white* and *red lights*:—(1.) A *drum* indicates a distant storm in an unknown direction. Should the storm approach, the signal will be changed. At night, *two white* lights, horizontal, are shown. (2.) A *cone*, *point upwards*, above a *drum*, indicates that a cyclone will pass some distance to the northward, and that strong gales between south and west are probable. At night, *one red* light and *one white* light, horizontal, are shown. (3.) A *drum* above a *cone*, *point downwards*, indicates that a cyclone will pass some distance to the southward, and that strong winds between east and south are probable. At night, *two red* lights, horizontal, are shown. (4.) A *ball* above a *cone*, *point upwards*, indicates a cyclone in a position dangerous to the locality, without being imminent, leaving time for further notice. At night, *three white* lights, horizontal, are shown. (5.) A *cone*, *point upwards*, indicates that a cyclone will pass close northward, and that heavy gales from north, through west, to south, are probable. At night, *one white* light, *one red* light, and *one white* light, horizontal, are shown in the order mentioned. (6.) A *cone*, *point downwards*, indicates that a cyclone will pass close southward, and that heavy gales from north, through east, to south, are probable. At night, *one white* light and *two red* lights, horizontal, are shown in the order mentioned. (7.) A *ball* indicates the imminent approach of a cyclone. At night, *one red* light, *one white* light, and *one red* light, horizontal, are shown in the order mentioned. (8.) A *flag* (of any colour) above a *ball* indicates a heavy freshet, and that entering or leaving the river is prohibited, and all boat traffic stopped. At night, *three red* lights, horizontal, are shown. On any one of the above signals being made, mariners should take every possible precaution to ensure the safety of their vessels.

ICEBERGS IN SOUTH ATLANTIC.

Caution.—Icebergs have during the past few months been met with in the following localities:—(1.) From lat. 48° 58′ S., long. 38° 2′ W., to lat. 41° 2′ S., long. 35° 26′ W., numerous icebergs were seen. (2.) In lat. 44° 23′ S., long. 36° 56′ W., an impenetrable ice barrier was seen stretching away for many miles. (3.) From lat. 42° 8′ S., long. 34° 52′ W., to lat. 41° 34′ S., long. 34° 19′ W., many icebergs have been seen. (4.) In lat. 52° S., long. 46° W., icebergs were seen and constantly passed to lat. 40° S., long. 34° W. (5.) From lat. 41° 20′ S., long. 34° 40′ W., a compact mass of icebergs extending in a north-easterly direction for 40 miles. (6.) Another vessel passed icebergs constantly from a position in lat. 51° S., long. 45° W., to lat. 38° S., long. 28° W. (7.) Icebergs have been seen in lat. 39° 17′ S., long. 30° 18′ W. As it is evident the ice reported in April, 1892, has since extended considerably in all directions, mariners are warned to give the localities a wide berth.

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OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
3rd October, 1892.

THE following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

NOTE.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
776	China Sea, Tong King Gulf: Shieng Mun to Tra Ko Island, etc.	New Chart. September.
1429	China, E.: Nimrod Sound to Yung River, including the southern portion of the Chusan Archipelago	New Chart. September.
1137	N. America, E.: Labrador, Bradore Bay	New Chart. September.
1151	N. America, E.: Labrador, Chateau Bay	New Chart. September.
777	England, S. and W.: St. Agnes Head to Gerrans Bay	New Chart. October.
2403	Singapore Strait	From Great Karimon Island to south of Pulo Batam. Sept.
1789	Channels between Sumatra and Linga, Sinkep, &c.	Large corrections. October.
1570	S. Pacific: New Hebrides, Malo Island to Efate Island	Large corrections. September.
1391	Plans on the coast of Chile ..	New Chart. September.
1678	Newfoundland, N.E. Coast: Southern approach to Hare Bay	New Chart. October.

Agent for the sale of Admiralty Charts, MR. J. D. POTTER, 31, *Poultry, London, E.C.*

OFFICIAL RETURN OF BRITISH WRECKS IN SEPTEMBER, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of September, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	41	7,937	49
Steam	4	991	Nil.
Total	45	8,928	49

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports

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received in September relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—GEORGE J. SWANSTON, Assistant-Secretary, Marine Department, Board of Trade, 1st October, 1892.

THE Board of Trade have received through the Consul-General for Sweden and Norway, a silver medal of the 2nd class for Alexander Cutting, master, and silver medals of the 3rd class for Thomas Stuckland and Thomas Huges, mates, and for Oliver White, W. Mayer, and John Millings, seamen of the steam trawler, *Witham*, of Boston, which have been awarded to them by the Norwegian Government in recognition of their services in rescuing the shipwrecked crew of the Norwegian schooner, *Magenta*, in November, 1890, and of the Norwegian barque, *Atlas*, in August, 1891.

OFFICIAL INQUIRIES AT HOME, 1892.

4589. *Mona's Isle*, s.s.; built at Greenock, 1882; owned by Isle of Man Steam Packet Company, Limited; tonnage, 557, Dublin to Douglas, 280 passengers; stranded 1¼ mile S.W. of Castletown, September 6, 1892. Inquiry held at Liverpool, September 28, 1892, before Stewart, Judge; Cosens and Baker, N.A. Stranding caused by master proceeding in a fog upon a course approaching the land when his position was uncertain. The lead was also neglected, and vessel was navigated at too high a rate of speed. Certificate suspended for three months, recommended for one as mate.

4594. *Arina*, barquentine; built at Sunderland, 1869; owned by Mr. J. Sutcliffe; tonnage, 243; Cartagena, U.S. of Columbia, to La Guna de Terminos, Mexico; ballast; stranded on Serrana Bank, Carribean Sea, August 10, 1892. Inquiry held at Hull, October 5, 1892, before Stratten and Brodrick, Justices; Methven and Davis, N.A. Stranding caused by a good look-out not having been kept, and by the absence of master from deck when his presence was absolutely necessary. Certificate suspended for three months.

4596. *Llangorse*, s.s.; built at Wallsend, 1888; owned by Mr. C. E. Stallybrass and others; tonnage, 1,071; Poli to Gibraltar; maize; stranded on Cani Rocks, off Tunis, September 1, 1892. Inquiry held at Cardiff, October 7, 1892, before Lewis, Judge; Ward and Parfitt, N.A. Casualty due to master neglecting to verify his position on approaching Cani Rocks, and to a bad look-out. Certificate suspended for one month.

INQUIRIES BY INSPECTORS, 1892.

52. *Dunmurry*. This steamship capsized in the August 29, 1891, and the Court of Inquiry, held i found that her cargo of grain was stowed in accordan of the Board of Underwriters at New York. Depositio

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crew who had not arrived in England in time to be examined by the Court showing that the grain was improperly loaded, further inquiry was ordered into the stowage of the cargo. This inquiry was held at Cardiff, June, 1892, and at London, August, 1892, before Howard-Smith and Castle, Inspectors. New evidence unreliable, and bolstered up with gross exaggerations. Vessel loaded in accordance with New York Rules, and the Carriage of Grain Act. New York Rules as given in Board of Trade "Official Notice" obsolete.

53. *Gellivara*, s.s.; explosion in stoke-hold, when one life was lost, April 18, 1892, when on voyage from Barry to Buenos Ayres. Inquiry held at Liverpool, September 26, 1892, before Richardson, Inspector. Explosion apparently due to a slight leak from a boiler causing salt to accumulate in a hollow form containing a very small quantity of water, and to steam being generated until the salt crust could no longer withstand the increasing pressure.

Fishery Inquiry, 1892.

S. 64. *Magneta*, s.s.; built at Hull, 1885; owned by Messrs. F. and T. Ross; tonnage, 51; Hull to Milford Haven; ballast; stranded near Sherringham, Norfolk, September 22, 1892. Inquiry held at Hull, October 7, 1892, before Smith and Toozes, Justices; Methven and Davies, N.A. Stranding caused by skipper and pilot neglecting to make any allowance for tide and leeway, and by ship being somewhat closer to the shore than was estimated. Certificate of skipper suspended for three months; pilot fined £10 towards costs.

Official Inquiries Abroad, 1892.

4584. *Milton*, s.s.; foundered in Straits of Malacca, July 9, 1892, when eight lives were lost. Inquiry held at Penang, July 26, 1892. Vessel sprang a leak during prolonged rough weather owing primarily to the bad stowage of the dead-weight portion of her cargo.

4585. *Africa*, barque; abandoned in lat. 40° S., long. 31° E., June 8, 1892. Inquiry held at Newcastle, N.S.W., July 27, 1892. Vessel, which was laden with case kerosine oil, sprang a leak during heavy weather and became waterlogged. Abandonment justifiable.

4586. *Quadra*, s.s.; stranded in Houston Stewart Channel, Queen Charlotte Islands, May 14, 1892. Inquiry held at Esquimalt, July 25, 1892. Vessel struck a sunken rock not marked on chart.

4587. *Elpitha*, s.s.; foundered 89 miles W. of Tripoli, August 10, 1892. Inquiry held at Beyrout, August 27, 1892. Vessel probably not entirely seaworthy having regard to her age, to the facts that she had not been surveyed for six years and that the weather was calm. Supposing that the stern-shaft broke this would not under the circumstances be sufficient to cause the foundering of a ship otherwise perfectly sound.

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4588. *Enterprise*, schooner; wrecked at Forth Heads, Tasmania, July 21, 1892. Inquiry held at Ulverstone, August 8, 1892. Wreck caused by the strong fresh in the river, and to master not having the assistance of a pilot.

4590. *Mystery*, ketch; foundered off Norah Head, July 7, 1892. Inquiry held at Sydney, July 25, 1892. Casualty caused by vessel springing a leak.

4591. *Eleanor*, tug, and *Warooka*, s.s.; in collision in Port Adelaide, where latter, which was lying at a wharf, sank, May 8, 1892. Inquiry held at Adelaide, July 7, 1892. Master of tug censured for having too much way on his vessel when in a narrow channel on a dark night.

4592. *Dennis Brundrit*, barque; stranded on Centre Island, Salvador, East Falklands, July 20, 1892. Inquiry held at Stanley, Falkland Islands, August 2, 1892. Casualty due to the sudden shifting of the wind when vessel was in a strong tide and in narrow waters, and to anchor not holding when let go. Expenses of Court, six guineas, to be paid by ship.

4593. *Dorunda*, s.s.; stranded on Bancoora Patch, Port Kennedy, July 16, 1892. Inquiry held at Thursday Island, July 21, 1892. Casualty owing to the incompetency of pilot.

4595. *Golden Horn*, barque; stranded on Santa Rosa Island, off Santa Barbara, California, September 12, 1892. Inquiry held at Santa Barbara, September 17, 1892. Vessel navigated in a proper manner. Evidence showed the existence of strong N.E. currents setting on to the S.W. shore of Santa Rosa Island, which are not referred to in sailing directions or charts.

4597. *Silchar*, s.s., and *Dundee*, s.s.; in collision in the Hooghly, May 20, 1892, when latter was damaged, but not materially. Inquiry held at Calcutta, July 1, 1892. Casualty due to serang of *Silchar* not allowing certain vessels to pass before leaving his moorings.

NOTES.

A PAPER dealing with the duties of officers and seamen in the British Mercantile Marine was read on the 21st ultimo, at the Shipmasters' Society, London, by Mr. William Allingham, whose writings on nautical topics are familiar to many. He strongly advised officers to become working members of one or other of the several societies lest advantage be taken of their scattered state by Shipowners' Federations and Seamen's Unions. The duties of officers to themselves, their subordinates, and their employers, also the duties of seamen, were sketched with a free hand. Examples were also given of the disabilities

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under which the mercantile branch of the nautical profession labours. After drawing attention to the fact that seafarers are utterly excluded from the benefits of free education and free libraries, he urged officers to demand a proper share of the educational grant. This paper will shortly be published in pamphlet form by the Shipmasters' Society, for the benefit of officers' widows and orphans. It should, therefore, be in the hands of all those connected with our Mercantile Marine.

THE American *Railroad and Engineering Journal* for October refers to the recent loss of the steel lake steamer *Western Reserve*, this being the first serious casualty among the large steel steamers which are now becoming so common on the lakes. The only survivor states positively that the ship broke in two in a sea which was not by any means so high as some that are met with on the lakes. "It may well be asked," says our able contemporary, "whether the tendency has not been to secure light draught and great carrying capacity at the expense of complete safety, and whether the strains to which vessels of great size are subjected have not been underestimated?"

IN another part of the same issue our contemporary gives an account of the launch of a lake steamer indicating that light scantlings obtain in that class of construction. The *W. H. Gilbert* is 345 ft. in length, 42½ ft. beam and 20½ ft. depth of hold. "On launching," it is said, "the *Gilbert* showed a mean draught of only 4 ft., a record in construction of such large tonnage which is difficult to duplicate, and proving that the high class of material used in her construction had been placed according to the best skill known in the science of marine architecture." It is added that the *Gilbert* is classed A1 in the Inland Lloyd's classification books.

THOSE who are familiar with the lake navigation often describe the very deep loading of lake craft, and with deep loading and light scantlings trouble must come sooner or later.

BY the death of Dr. Alexander Kirk, on the 5th October, the engineering and shipbuilding world sustained a considerable loss. As early as 1874 he designed an engine on the triple-expansion principle, and for years worked hard to secure its adoption, in which he succeeded in the s.s. *Aberdeen*, built as one of Messrs. Thomson's China tea-clippers in 1881. At present the triple-expansion engine, of which Dr. Kirk was

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practically the inventor, is the general rule. For many years past Dr. Kirk has been associated with the important firm of Messrs. Napier & Co., shipbuilders and engineers, of the Clyde, and during the last few years he has been the chief partner. He has been a frequent contributor to the Transactions of the Institution of Naval Architects and to those of the Institution of Engineers and Shipbuilders in Scotland, and was President of the latter Society in the Jubilee year.

THE new number of *Répertoire Général de la Marine Marchande*, published by the Bureau Veritas, gives statistics of the Mercantile Marine of the world. It appears that the British India Company still has the first position, although it is hard pressed by the Peninsular and Oriental and also by the Messageries Maritimes. The figures of the thirteen principal companies are as follows:—

Company.	Flag.	Ships.	Gross Tonnage.
British India	English	103	239,635
Peninsular and Oriental	,,	36	216,887
Messageries Maritimes	French	61	202,522
North German Lloyd's	German	66	197,169
Navigazione Generale	Italian	106	170,755
Cie. Générale Transatlantique ...	French	66	167,483
Hamburg American	German	56	165,427
Wilson Line	English	86	158,089
Austrian Lloyd's	Austrian	73	128,359
White Star Line	English	20	95,704
Pacific Steam Navigation Co. ...	,,	86	95,882
Cia. Transatlantica	Spanish	34	94,168
Cunard	English	26	85,913

THE "Serve" tube for marine and locomotive boilers, to which we have in former numbers referred, seems to be a success. We are informed that the Inman and International Line, apparently satisfied with the results obtained in the boilers of their steamer *Pennsylvania*, have decided to have these tubes fitted in the boilers of their two new large cargo steamers—one of which is to be built by Messrs. Denny Bros., Dumbarton, and the other by Messrs. Jas. and Geo. Thompson, Limited, Clydebank. The Bedouin Steamship Company's steamer *Sheik*, recently built by Palmer's Shipbuilding and Iron Company, Limited, Jarrow, the Allan Line's steamer *Polynesian*, and a steamship for the "Nautilus" Company, are also amongst the number of vessels which have had "Serve" tubes fitted in their boilers.

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THE

NAUTICAL MAGAZINE

AND JOURNAL OF THE

ROYAL NAVAL RESERVE.

VOLUME LXI., No. XII.

DECEMBER, 1892.

OCEANOGRAPHY.

THE ATLANTIC OCEAN. ITS CURRENTS.

SOME 400 years have elapsed since the adventurous Columbus made his never-to-be-forgotten voyage from Europe to America. Then the Atlantic was indeed an unknown expanse of water. Its tides, its currents, its shallows, and its depths, together with the movements of the great air ocean superincumbent on its surface, were undetermined factors altogether hidden from those early navigators. Now, though we are in the year of grace 1892, the most traversed of the oceans has still its hidden secrets; secrets, however, from which modern science and research has partly succeeded in tearing the veil.

The steps by which our present state of knowledge has been acquired have been attended with all the pain and labour characteristic of experience gained rather by accident than design. Though much has been learned of the currents of the Atlantic through the excellent work achieved by the scientific researches conducted under the auspices of various maritime powers, it must be admitted that much knowledge has been acquired by chance, derelict vessels often demonstrating the existence of a drift hitherto unsuspected. In

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assessing the value of the different sources contributing to the lore of Atlantic currents, it must be admitted with regret that the British shipmaster does not take the place he should in the list of observers. It is not that his faculties of observation are one whit less acute than those of his brother navigator, German or American, for instance, nor is it that under certain conditions he does not command the leisure. If asked himself to account for what is unfortunately an established fact, he would no doubt answer that he is paid to work his ship not to take meteorological observations. "Why should I trouble myself with sampling sea-water or observing the different tints of the ocean; or would any useful purpose be served by observing the bits of floating weed that my vessel passes?" &c., &c. To which there is, of course, but one answer, viz., that the extended and systematic observation of such minutiæ with some sort of scientific exactness would tend to set at rest many vexed questions and simplify navigation very materially.

With all his virtues, the British shipmaster has one defect, and that arises from his defective education. He is not a trained observer. Those who cry out for a higher standard of education would do well to add *broader* to their demand, and make it a higher and broader educational scheme. There must be in the British merchant service an enormous fund of latent knowledge as to oceanic phenomena. If shipmasters' societies would but encourage and direct their members in the matter of scientific observation, a great and ever-increasing benefit would be conferred upon our merchant service, and the sea would soon cease to be what in the main it undoubtedly is, a sealed book.

Most persons nowadays sea-going and otherwise, are familiar with the general oceanic circulation of the North Atlantic. How the mighty equatorial current bifurcating at Cape San Roque, sends a north-westerly stream along the northern shores of the Brazils and a south-easterly one towards the southerly extremity of South America. Equally well-known is the fact that the north-easterly branch of this main artery gives origin to the Gulf Stream. It is not in the province of the present paper to sketch the course of this important current, but merely to show what has been done of recent years to add to our knowledge of this and other currents of the Atlantic.

The easterly set of the waters in the North Atlantic was known to Columbus, for this intrepid navigator says: "I

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regard it as proved that the waters of the sea move from east to west as do the heavens (apparently, of course) *con los ceilos.*" Early researches traced the Gulf Stream, as its name implies, to a home in the Gulf of Mexico. Only a small section, however, of the waters of the Stream make the tour of the Gulf. Captain Bartlett, of the U.S. steamship *Blake*, has demonstrated his observations made on the spot. What really happens is this. Between the Lesser Antilles and the South American coast, an offset from the equatorial current enters the Caribbean Sea, in the deep basin of which it is partially checked by a shore extending westwards from Honduras. The current is thus turned round so as to pass eastward along the south coast of San Domingo and rejoin the main current near Porto Rico. This washes the northern shores of Porto Rico and San Domingo, and is divided by Cuba into two streams, one of which flows on its north side to the Bahama Banks, while the other passes through Bartlett Deep between Cuba and Yucatan, turning northward through Yucatan passage, then eastward through the Florida Strait, where it unites with the other stream. Before finally issuing from the Strait it is joined by the waters that have been carried into the Gulf of Mexico and have made the circuit of its shores.

The more salient features of the Gulf Stream and drift have frequently been alluded to in the pages of the *Nautical Magazine*, and charts have been published, showing the direction and duration of various bottle drifts, so that there is no need to allude to them in this paper. Considerable information has, however, been gained within a very recent period as to the immense floating seaweed area that lies in the vortex of the current sweep of the North Atlantic. Before stating what is the exact amount of present knowledge on this subject, it will not be out of place to mention on the 400th anniversary of the discovery of the New World, the experiences of Columbus in connection with the Sargasso of the North Atlantic.

The existence of dense muddy coagulated seas of seaweed has ever found a place among the myths of maritime nations. Plutarch most vigorously reproves the geographers of his day for their romantic inventions. He says of them that when their knowledge ends they rave about horrid landscapes, deserts, sky-reaching ice and *coagulated seas*. Modern experience would show that the romancing instinct is not altogether extinct among the successors to Plutarch's earth-lore seekers. Satrapes, too, is on the authority of Herodotus said to have

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excused his inability to circumnavigate Africa because his ship had been stopped by the "plants of the sea." Columbus, however, is the undoubted discoverer of the Sargasso sea under discussion. He encountered quantities of floating weed (yerba) on 11 days out of the 26 that his famous voyage occupied. The experience of the home journey, 17th January to 17th February, 1493, was almost identical, weed being met with on nine days. "Sometimes," the great navigator wrote, "the weed comes in such compact masses as to cause the sea to look like a coagulated mass." From this description his biographers conceived and gave to the world accounts of a vast bank of fucus lying to the south-west of the Azores, and so dense as to prevent the passage of ships. These myths were long existent, and were only dispelled by the knowledge gained consequent upon the increase of trans-ocean trade. Humboldt speaks of the Sargasso as "scattered weed," an expression clearly indicative of the opinion of the author of "Cosmos" as to the origin and formation of this great weedy sea.

Our own *Challenger* expedition, along with those of the United States, have done much to define the limits of, and to account for, the accumulated mass of floating weed that lies in the great Atlantic vortex. The *Talisman* observations, 1883, furnished much useful information, as also did the cruise of the *Plankton* in 1889. In addition to the information acquired by the above expeditions, Dr. O. Krummel, of Berlin, has requisitioned the log-books, or rather extracts from the logs of scientific observers in the German merchant service, and has been enabled to formulate many important facts respecting this the greatest of Sargasso seas.

The area of maximum weediness has been found to be an elliptical section of ocean lying south of 35° N. latitude, and west of 35° W. longitude. The decrease towards the south commences at 25° N. The major axis of the ellipse, roughly speaking, lies along the Tropic of Cancer, extending from 40° W. to 73° W. The minor axis is formed by a portion of the 55th meridian, and extends from 25° N. to 35° N. latitude. Surrounding this ellipse is a well-defined oval ring, 6 or 7 degrees in width, in which the weed is more thinly distributed. Outside this area again there is another area in which the weed is of still rarer occurrence. The outermost region in which the Sargasso drift circulates has a point 52° N. and 45° W. for its most northerly limit, the Madeira for its most

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easterly boundary, while on the south it stretches as far south as 15° N. Professor O. Krummel endeavours to estimate the amount of surface covered with weed in each of the sections with the following results :—

The region of densest weed, *i.e.*, the Sargasso sea proper, would, he says, probably be covered with weed to an excess of 10 per cent., with a frequent occurrence of even 25 per cent. In the next belt the weed frequency would lie between 5 and 10 per cent., falling to 1 to 5 per cent. in the next zone, while in the outermost region the amount of sea surface covered by the weed would vary from three-tenths to 1 per cent.

Most interesting is the difference noticed in the various seasons. Northward from 45° N. the scattered weed is only noticed in the later summer and autumn, whilst in spring it disappears completely. The further south the greater the frequency through all the seasons. Near 30° N. the maximum is reached in winter, and southward from the 25th parallel most weed is encountered in spring. The shores of Florida, the West India Islands, Honduras, Yucatan and the Caribbean Sea littoral, together with certain of the Gulf states, and those immediately north of Florida are discovered to supply the weed which is carried away by the Gulf Stream. It must not be supposed that the indraft into the Sargasso sea secures that all the detached weeds shall find their way into the *praderias de yerva*, or seaweed meadows. Wherever the Gulf Stream exists as a defined current of any force whatever, then these weeds are sure to be found there. The coasts of France, Ireland, and even Durham, have all furnished evidences of the distances to which the Gulf weed may be carried. Much of it, too, becomes waterlogged, and sinks to the bottom, and thus does not float long enough to reach the calm area of densest Sargasso.

As to the rate at which these weeds travel, that, of course, varies at different parts of the route. Dr. O. Krummel supposes a bunch of weed detached from the Bahama Reef, would make the voyage of 600 knots to Cape Hatteras in a fortnight, an average of about 2 knots an hour, by no means bad going, when the nature of the flotsam is considered. The next stage of the journey, 780 knots to 60° W., would take about a month to perform, the speed of the weed now being reduced one-half. From 60° W. to 40° W., the rate would be reduced to half a knot per hour, and thus the 950 knots would add about 2 months and three weeks to the voyage. From 40° W., to the south of the Azores, is about 600 knots, and the maximum

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speed of the weed per hour in this section of the journey, would be one-third of a knot. Now the weed is in a position that it gets drawn further and further towards the vortex of the whirl. The journey would thus, from Cape Hatteras to the Azores, occupy five and a-half or six months. Once in the Sargasso itself, the weed has a new feature opened to it. The area of the sea, or at least the most densely weed-covered section of it, roughly coincides with the North Atlantic region of frequent calms, so that the weeds are rarely disturbed, save by an ocean swell—the reflection of some distant storm. Life swarms in this sea meadow, and the seaweed drift lives on until waterlogged and flaccid, it slowly sinks to the bed of the ocean, thus making room for the fresh supplies of *fucus natans*, that the indraft is continually withdrawing from the whirl of oceanic currents. With regard to the origin of the Sargasso weed we have stated above the coasts from which the main supplies are derived. It was long, however, believed on the authority of the commander of the *Santa Maria*, that the weed masked some hidden rock. Others maintained that this "social weed" grew at the bottom, and after fructification, rose to the surface. One species of seaweed known as *Laminaria pyrifera* has been known to possess a stem over 850 feet in length. This has nothing, however, to do with the Sargasso weed, whose source is now absolutely established to be that alluded to above.

The rates of Atlantic drift arrived at by the German scientists roughly approximate with those determined by Albert, Prince of Monaco. During the years 1885-6-7 His Highness made several experiments in his sailing-yacht *Hirondelle*. In 1885 some 169 floats, weighted so as to offer no surface to the wind, were launched along a line 170 miles long in the direction of N. 14° W., from a point 110 miles from Corvo, one of the Azores. Next year 510 floats were launched on a line 510 miles long, lying along the meridian 17° 40′ W., and between 42° 34′ and 50° N. In 1887 no less than 931 floats were thrown overboard along a stretch extending from the Azores to Newfoundland. Each float was of thick glass covered with copper, with an intermediate coat of pitch, and contained a document printed in nine different languages, which invited anybody who might find one of the floats to deliver it into the hands of the nearest maritime authorities, with detailed indications as to place and date of finding. Another and smaller group of floats were sent on their voyage along a line of

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128 miles lying between the two points lat. 49° 31′ N., long. 29° 7′ W., and lat. 48° 58′ N., long. 26° 7′ W. In all 227 floats found their way back to the Prince. They were found on the following shores:—

Azores	37	Spain, N. ...	14
Madeira	6	Africa, W. ...	7
Canaries	21	Antilles	23
Iceland	3	Central America	1
Norway	22	Bermudas ...	4
British Isles ...	29	Open Sea ...	3
France, W. ...	36	Various ...	5

Some of the floats had been voyaging for a long period when they were recovered. The recovery of 4 floats, 2 on the coast of France, after being afloat for 4 years 3 months and 5 years 3 months respectively, and 2 on Madeira, after voyages of 3 years 11 months and 4 years 2 months respectively, enables the experimenter to establish the fact that the cycle described by the objects drawn into the vortex of the waters of the North Atlantic may be renewed indefinitely, except they escape by an offset into the Arctic Regions along the coasts of Ireland, Scotland, and Scandinavia.

The velocities are considered most accurate that are furnished by floats recovered on thickly populated coasts. Those which were picked up on the shores of Iceland are discarded, because the sparsity of population being so great, there is no knowing how long they have been buffeted about the coast before being found.

The mean velocity for the region comprised between the Azores, Ireland, and Norway is 3·97 nautical miles per day. Between the Azores, France, Portugal, and the Canaries, the rate of motion is 5·18 knots in the twenty-four hours. From the Canaries to the West Indies, the Bahamas, and even to Bermuda, it attains 10·11 knots in the day. In the eastern portion of the arc, which extends from Bermuda to the Azores, it falls again to 6·42 miles in the same period. The mean average which the combined results give for the North Atlantic is thus 4·48 nautical miles in 24 hours.

Some information was forthcoming at the meeting of the British Association in August last, which brings information respecting the currents of the Gulf of Guinea. The facts were communicated by J. Y. Buchanan, F.R.S. The experiments were made during sounding for and actually laying a submarine

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cable. January, February, July, August and September, were the months in which the observations were made. The surface water of high temperature all over the Gulf of Guinea forms a layer not over 30 fathoms in thickness. Usually a moderate breeze off shore is sufficient to blow it away, and its place is taken by the denser and colder water immediately below it. The change of the water on the line from Appi to St. Thomé between the seasons is most remarkable. The density of this water is higher than that of the abysmal water below it, and it is surmised that it comes from regions farther west by a return under-current. Evidences of such a current were found when experimenting close to the equator in the longitude of Ascension.

Generally the current along the Guinea coast was found to set strongly to the eastward of the well-known Guinea current. In the bight near the Island of St. Thomé the current set in a north-westerly direction, and was strong enough to set the ship back while heaving in the sounding wire by about as much as she steamed forward between soundings. When the *Buccaneer* was on passage between Ascension and Conakry some interesting current observations were made in the neighbourhood of the equator. Here a strong current to the eastward was found at 50 fathoms, running at the rate of 1·3 knots per hour; the surface water setting to the westward at half a knot per hour.

Bottles were thrown overboard, and four of them were recovered, the particulars of their drift being as follows:—

	Days Drifting.	Position. Lat.	Long.	Miles Drifted.	Direction True.	Rate per Day.
A.	58	6° 40′ N.	12° 32′ W.		East	
		Picked up			along	
		5° 47′ N.	0° 35′ E.	862	Coast.	15
B.	53	4° 49′ N.	9° 38′ W.		East	
		Picked up			along	
		6° 8′ N.	1° 17′ E.	690	Coast.	13
C.	59	6° 25′ N.	14° 31′ W.			
		4° 45′ N.	8° 31′ W.	372	S. 74° E.	6·3
D.	147	0° 21′ N.	7° 37′ E.			
		3° 14′ N.	9° 57′ E.	230	N. 41° E.	1·6

Bottles A and B were thrown overboard not very far from each other in the beginning of January, and to the west of Cape Palmas. They were carried rapidly to the eastward and

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picked up within 3 days of each other near to Cape St. Paul. Bottle C was launched also to the west of Cape Palmas but much farther off shore, and in the month of March it was drifted right across the routes of A and B, and was cast up on the Kroo coast. Had the same current prevailed in March as did in January, C on arriving in the track of A and B ought to have been carried like them into the bight, instead of this it never passed Cape Palmas. Bottle D was thrown overboard between the Gaboon River and St. Thomé, and drifted very slowly in a north-easterly direction, and stranded near the Cameroon River, having required 147 days to make good a distance of 230 miles. No doubt it covered a great deal more ground, being drifted backwards and forwards by the very conflicting currents of the region. More thorough investigations than these, however, are necessary to determine with exactness the set and velocity of Guinea currents: when they are assessed with accuracy, however, a great benefit will be conferred upon navigators.

It will be noticed that in writing of the currents of the North Atlantic, or rather the latest discoveries connected with them, no allusion is made to the important work carried on by the United States Hydrographical Department. The reason is simply that the labours of this useful and beneficial department have already been dealt with in the columns of the *Nautical Magazine*.

Finality on the subject of North Atlantic currents is still far off, and is likely to remain so. British shipmasters can, if they chose, do much to assist in the elucidation of many matters upon which information is yet of the vague and visionary type. If they would but interest the tedium of a long voyage with the *practical* study of oceanography, and if more of those, who, like the Prince of Monaco, are possessed of wealth and leisure, would but like him lend their powers in acquiring useful knowledge, much of our ignorance on the subject of ocean currents and their attendant phenomena would soon be cleared away.

RICHARD BEYNON.

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SCREENS TO SIDE-LIGHTS.

IN our number for April last we gave an account of the new instructions of the Board of Trade as to lights and the means of making fog-signals. Those regulations were a consequence of the conclusions come to by the International Maritime Conference of 1889. One part of them has provoked considerable discussion since, and is the subject of a memorandum just issued by the Board of Trade. The side-lights of ships, as is pretty well known, are intended to be so fitted as to be seen from right a-head to two points abaft the beam. The Regulations for Preventing Collision at Sea prescribe as follows:—

Article 3 (*d.*) "The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light so as to prevent these lights from being seen across the bow."

In order to carry out this regulation the new instructions require the screen to be always three feet in length, measured from a line passing transversely through the outer edge of the wick. If a fore-and-aft line be drawn through the outer edge of the wick of the lamp, and, at a length of three feet, two and a-half inches be set off inboard of this line, this gives the point at which the light must be cut off at the fore edge of the screen so as to permit no ray of light to diverge from a fore-and-aft line to a greater angle than 4°. With this arrangement the most divergent rays of the side-lights will cross at a distance forward of the lights of 357 feet in a vessel of 50 feet beam, and of 214 feet in a vessel of 30 feet beam.

The instruction which this superseded directed that screens should never be less than three feet in length, measured from the fore-side of the glass of the lamp, and that the screen should be so fitted as that the outer edge of the screen, or chock on it, and the inner edge of the glass of the lamp should be in a fore-and-aft line.

The new instruction directly mentions the crossing of the lights, the old one does not; hence, an idea has become current that, now for the first time, provision is to be made for the rays of light crossing ahead of the ship. It is well-known that, practically, to ensure the lights being properly seen right ahead, the rays must cross and always have crossed.

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Under the old instruction, it was merely the inner edge of the lens which was screened in a fore-and-aft line. But the wick is situated some distance outside the inner edge of the lens, and in a large lamp, it is farther out than in a small one, and thus the rough method, formerly in use, caused the rays to cross at some uncertain point ahead. With a large lamp, the distance would be shorter; with a long screen it would be longer; but it was uncertain and ill-defined. We have said that the length of screen of the new instruction is fixed at three feet. Many existing screens are longer than three feet. In such cases, the necessary condition is complied with, if, instead of the screening point being placed at two and a-half inches within a fore-and-aft line through the outer edge of the wick, it be placed at a distance obtained by multiplying the length of the screen in inches, by $\frac{7}{100}$ths. Thus, by the new instructions, the screening angle is fixed and certain, whatever the length of the screen or size of the lamp.

To remove misapprehensions on the point, Sir Digby Murray, in the new memorandum, after referring to the regulation we quoted above, goes on to state that the Washington Conference passed the following resolution on the subject:—"The side-lights should be so screened, as to prevent the most convergent rays of the light from being seen across the bows more than half a point." After quoting the new instructions on this head, he goes on to say:—"These new instructions require the lights to be screened at a finer angle than has ever been the case before, and if the lights are properly screened in accordance with them, it is impossible for the lights to be seen from the forecastle-head in any sea-going vessel, of which there have been some recent examples." To further illustrate the question, a drawing is given showing two steamers meeting end on. One, B, is about twice the beam of the other, A. These vessels are supposed to have their lights screened in a fore-and-aft line exactly so that at no distance ahead could either light be seen across the bow. This represents the supposed literal compliance with the regulations. The consequence is that the officer of the watch on board of A cannot see the side-lights of B, no matter what part of the bridge he is standing on, nor is it possible for the officer of the watch on board A to see both side-lights of B at the same time, no matter how the position of A with regard to B may be varied. The officer of the watch on board of B, if he stands in the middle of the bridge, cannot see either of

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the side-lights of A. If he stands on the extreme starboard side of the bridge he sees the red light only, and if he stands on the extreme port side of the bridge, he sees the green light only, nor can the position of B be varied so as to enable him to see both the side-lights of A at one and the same time. To remedy this state of things the side-lights must cross at some angle ahead of the ship. Art. 3 (*b*) and (*c*) says: *So fixed as to throw the light from right ahead to two points abaft the beam*, and the Board of Trade have always construed *right ahead* to mean right ahead of the ship. The Washington Conference says: *The side-lights should be so screened as to prevent the most convergent rays of the light being seen across the bows more than half a point.* The Board of Trade after careful experiments have fixed this angle at 4°, measured from the outer edge of the wick. If the wick is 1¼ inches in width the angle will be about 3° if measured from the centre, and 2° if measured from the inside edge of the wick."

THE GILBERT ISLANDS, CENTRAL PACIFIC.

THE Gilbert or Kingsmill Archipelago extends from latitude 3½° N. to 2¾° S., and between longitude 172½° and 177¼° E., within which area is included sixteen groups of islands, besides which are two outlying islands the inhabitants of which speak the same language as the natives of the Gilbert group.

One of the easternmost groups, south of the equator, was discovered by Byron in June, 1765. Captains Marshall and Gilbert, in the *Scarborough* and *Charlotte*, saw some of the northern groups in 1788, others were discovered by Captain Bishop of the *Nautilus* in 1799, and some were seen by the brig *Elizabeth* in 1809. Captain Duperrey, of the French corvette *Coquille*, visited and partially explored some groups in 1824; a very complete account of the archipelago will be found in Vol. 5 of Commodore Wilkes' *United States Exploring Expedition*, the larger part of the groups having been surveyed by Captain Hudson of the U.S. ship *Peacock*, and Lieutenant Knox of the *Flying Fish*. Within the last few years several islands of the group have been visited by ships

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of the Royal Navy cruizing in the Pacific. Protestant Mission stations have for many years been established on all the islands.

The population, for the size of the islands, is very large. In physical appearance the people are dark, of the middle size, well made and stalwart, but not now so pugnacious as they formerly were.

Supplies, excepting the cocoa-nut, are scarce; besides fruit and vegetables, the food of the natives consists of fish; shell-fish of all kinds is eaten, turtle is taken in the season. Water is often scarce, and usually brackish.

From October to April the winds are from northward and westward, when rain and typhoon-like gales occur. From May to September the weather is fine, the wind easterly, and the sky clear, but occasionally slight showers.

The islands being on the equator, they experience the usual westerly equatorial current, and the northern islands the easterly counter current.

MAKIN, or Pitt Island, the northern-most of the Gilbert group, is a reef without a lagoon, $2\frac{3}{4}$ miles long, and varies in width from a quarter of a mile to one mile.

TARITARI, or Touching atoll, is 11 miles long, and has three passages into the lagoon. Population 3,000, all Protestants.

MARAKI, or Matthew atoll, is 5 miles long and 3 miles wide. Population 1,900.

APÁIANG, or Charlotte atoll, is 16 miles long and 5 miles wide. Population 1,300, all Protestants.

TARAWA, or Cook atoll, is 18 miles long and 13 miles wide. Population 1,300, all Protestants.

MAIANA, or Hall atoll, is 9 miles long and 6 miles wide. Population 1,700.

APAMAMA, or Hopper atoll, is 12 miles long and 5 miles wide. Population 650.

KURIA, or Woodle Island, is 4 miles long and 2 miles wide; no lagoon.

ARANUKA, or Henderville atoll, is 6 miles long, and varies from 1 to 5 miles in width. The above-mentioned islands are north of the equator; the islands that follow are south of the equator.

NONUTI, or Sydenham atoll, is 20 miles long and 8 miles wide.

TAPUTEUEA, or Drummond atoll, is 30 miles long. Population 7,000, all Protestants.

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NUKUNAU, or Byron Island, is 8 miles long and a quarter to 1½ miles wide. Population 1,618, and about 1,000 Christians.

PERU, or Francis atoll, is 11 miles long and half to 1½ miles wide. Population 2,000.

ONOATOA, or Clerk atoll, is 12 miles long. Population 1,200.

TAMANA, or Rotcher Island, is 3 miles long and three-quarters of a mile wide.

ARORAI, or Hurd Island, is 6 miles long and 1½ miles wide. Population 1,200, all Christians. This is the southern-most of the Gilbert group.

The two following islands, to the westward of 170° E., are considered to belong to the Gilbert group, inasmuch as the natives speak the same dialect.

PAANOPA, or Ocean Island, is 12 miles in circuit, well wooded, without harbour or anchorage.

NAURU, or Pleasant Island, is 12 miles in circuit, 100 feet high, well wooded, no harbour or anchorage. Population 1,200, and considered a fine race.

The islands are governed by their own native chiefs; in some cases a chief will hold sway over two or more islands; and the missionaries exercise a mild jurisdiction. The British protectorate is extended over the Gilbert Islands, and the cruizers have lately been engaged, on behalf of the natives, in investigating the character of the labour contracts,—a traffic which tends to depopulate, and has the effect of preventing the development of many of the islands in the Pacific.

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ALLOWANCE FOR TIDE IN COASTAL NAVIGATION.

THE case of the stranding of the steamer *Magneta* will serve as a good illustration to readers of the *Nautical* of the necessity for considering the tides in coastal navigation.

The enquiry into this vessel's loss was held at Hull on the 6th of October, and resulted in the suspension of the "*skipper's*" certificate for three months and in the fining of the pilot ten pounds, and it must be admitted that there would appear to be no reason for doubting the justice of the Court's decision.

The facts are as follows:—

She left the Spurn (bound for Milford Haven) at about 9.30 p.m., September 21st. At 4.10 a.m., September 22nd, she stranded close to Sherringham, on the Norfolk coast. The run is only about 60 miles. The question is, "How did she get there?"

The Court very properly found that the casualty was caused by the neglect to allow for the flood tide setting into the Wash, and for leeway owing to a fresh N.E. wind. There is also a reference to the course, but as it appears that the compasses were adjusted two years ago, and that there was no other evidence as to their errors, this is mere supposition and need not be gone into; they may have been wrong, they may have been correct.

Of the other two causes, the fresh N.E. wind and its accompanying sea should of course have been allowed for, and being perfectly plain, perhaps *was* allowed for. But there is another cause that was not manifest to mere observation, and this was, probably, the final and actual cause which brought her on shore—the tide.

The writer has, in past years, found coasting pilots with very hazy ideas as to the run and direction of tides on the open coasts. Given an estuary, a tidal river, or their own local harbours, and they are at home; but put them on a long channel trip, and it is only the smarter men amongst them who will be able to tell you how long you will have, for instance, a strong tide on the bow sweeping you landward. It is only too probable that this was the case in the present instance. Can shipmasters, then, prove whether their pilot has this requisite knowledge and overlook him accordingly? Certainly they

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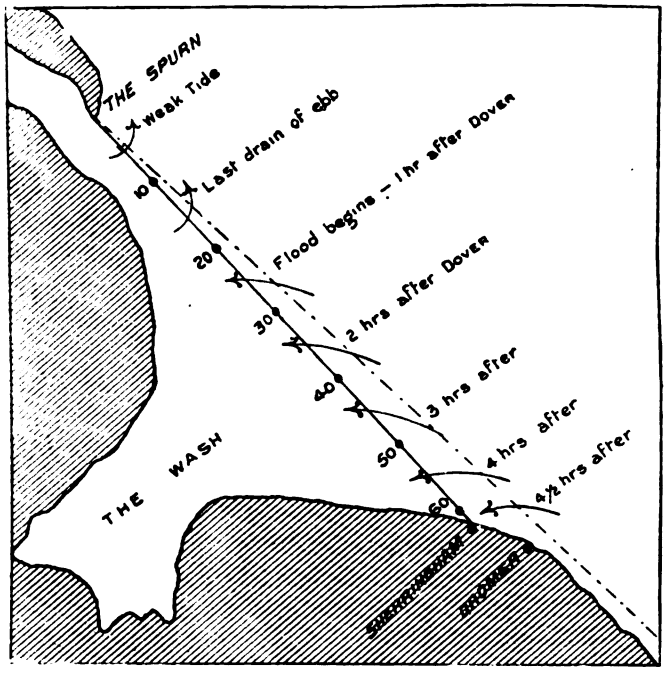
can. Let us look into this case and turn to our "Handy Book of the Tides."

Here is a small chart figuring the *Magneta's* run from the Spurn to Sherringham.

The Arrows show direction of Tide.



The dotted line shows course which should have been made.
The plain line shows actual course made good which brought her ashore.
She was about 4 or 5 miles to leeward.

The *Nautical Magazine's* tide table will tell us that on September 21st it was H.W. Dover at 11.34 p.m. The vessel left the Spurn at 9.30 p.m., or 2 *hours before H.W. Dover.* She took about 6½ hours on her run, and therefore stranded at about 4½ *hours after H.W. Dover.* How did she have the tide during that time? The "Handy Book" will instantly tell us. The *data* gained from that book are plotted on the chart before us; this shows that for her first two hours she had virtually no tide, perhaps enough to counteract what little leeway might be due to a beam wind. But now the tide turns, and for the rest of the run she has a tide on her port bow increasing in strength and driving her down into the Wash. She

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nears the Norfolk coast; the weather is hazy; Cromer light expected on the starboard bow is actually on the port bow and is not seen at all; there is no idea on the part of the man on watch that it is possible she may be to leeward; both pilot and skipper are below asleep in their bunks, the last word from them being, "You are in a fair way now, *there is nothing to fear*," and then finally before turning in telling the watch on deck not to go to the southward of the course; this was only two hours before she went ashore right under the cliffs at Sherringham!

Had it been clear, Cromer would no doubt have been seen in time, the pilot would have hauled her out, and no more notice would have been taken of the fact beyond a remark, "She must have been swept in a lot!" But it happened to be hazy over the land, nothing was seen, no lead was used, the silent tide was slowly pushing her away to leeward, and until she began to bump on the sand, everyone felt perfectly secure.

It may be taken as a general rule that when crossing any recess in the land, be it estuary or bay, you are liable to be swept in, whilst at a place like the Wash, where the north and south tides meet and rush in with combined forces, it is of vital importance to know whether the set is *in* or *out*. Intelligent action, based on such knowledge, would have saved this stranding, which has, fortunately, occurred without loss of life.

W.

MISSING SHIPS.

MANY a good ship has ere now left the land never more to return; even though constructed of the very best materials, and she herself a splendid specimen of the naval architect's art. Every omen may perchance have appeared peculiarly propitious on sailing day; yet the stately ship has disappeared, as utterly as though she had never been. Other vessels have met their fate within a few hours of leaving port, despite every effort put forth by the hardy toilers of the main to work them into safety and the open sea. A careering cyclone sweeps up the

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English Channel unexpectedly, and drives ship after ship beneath the waves, or on to some quicksand—

> "Ten cables from where green meadows
> And quiet homes could be seen,
> No greater space
> From peril to peace,
> But the savage sea between."

In either case the result is the same; for the devoted crews having proved the truth of Shakespeare's line that it is a double death to drown in ken of shore are drifted out to sea, and nothing more is ever heard of them or of their ocean home.

The Board of Trade Wreck Abstract for 1890-91, which has just recently been published, contains much that is of interest with respect to missing ships. Mr. Swanston is of opinion that the increase in the number of missing sailing-vessels during the twelve months under discussion, is a disagreeable feature of the figures, but freely confesses that the increase is, without doubt, chiefly due to the severe snowstorm which passed up the English Channel on the 9th and 10th March, 1891, and overwhelmed a large number of coasting-craft which were in the vicinity about those dates. He might also have pointed out that a previous gale in November, 1890, was evidently responsible for several of the remaining missing ones. The number of missing ships during 1890-91 was 90, against 52 in 1889-90, 67 in 1888-9, 71 in 1887-8, 80 in 1886-7, and an average of 125 in the 10 years preceding 1886-7. The missing ships of 1890-91 comprised 83 sailing-vessels, tonnage 27,157; and 7 steamships, tonnage 7,932. It is a most remarkable fact that, notwithstanding the great increase in the number of steam-ships on the register, the number of missing steamers was lower in 1890-91 than in any year on record, except 1885-6. This goes far to disprove the assertion of Mr. Plimsoll that steam-vessels of the present day are badly built. If it were possible to eliminate strandings and collisions, casualties to steam-ships would be few and far between.

Apparently there were not any indications on the early morning of the 9th March, 1891, that an awful snowstorm, almost rivalling an American blizzard, was close at hand advancing rapidly up the English Channel, leaving death and destruction in its wake. The masters of coasting craft were thoroughly deceived in their estimate of coming weather; and the State paid forecasters at the London Meteorological Office were little, if any, the wiser. Neither theory nor practice availed much as the terrible sequel showed. No fewer than

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26 small sailing-vessels, making their way from port to port around our south-west coast, ceased to exist that day, and their names appear in the missing list. The average age of these wooden vessels was 29 years, but 4 of them were between 40 and 50 years, and two had arrived at the good old age of threescore-and-ten. A barquentine of 315 tons, the *Maria*, is the largest on the list; but the average tonnage of the whole 26 sailers was only 98, and the crew scale was about 4·5 men per 100 tons register. All were heavily laden with cargoes of coal, granite, slates, clay, salt, ore, or potatoes; and the ketch, dandy, smack, and schooner rigs predominated. One iron steamship, the *Adirondack*, 1,302 tons register, bound from Newcastle to Genoa, has not been heard of since passing the Start on the 10th. Twenty-five sailers and three steamships stranded during the same gale with loss of life in several instances. All but two of the sailing-vessels were wooden coasting craft with an average tonnage of 53 and manned at the rate of 6·3 men per 100 tons register. They included a coastguard cruiser, a pilot cutter, several fishing smacks, and a few luggers. The average age of the vessels was 20 years, the most ancient being the smack, *Lord John Russell*, 60 years old. These curious craft all help to swell the grand total of casualties, but can scarcely claim a place in statistics that may be turned to the disadvantage of shipowners in any controversy that may arise. Only two ocean-going vessels appear to have stranded during this gale; the steel ship, *Bay of Panama*, homeward bound from Calcutta, and the barque, *Dryad*, from Shields and Valparaiso. The *Bay of Panama* was a four-master of 2,282 tons register, laden with 17,000 bales of jute and carrying 28 of a crew all told. She went on shore at Penare Point, when Captain Wright, his wife, all but one of six officers, four apprentices, and six of the seamen were either drowned or frozen to death in the rigging. During this snow storm no less than 53 men lost their lives, and 4 ships were stranded within a short distance of the Start Lighthouse; and Mr. Robert Bayly drew special attention to this fact in his earnest appeal for electrical communication on the coasts of the United Kingdom. One of these ill-fated vessels was the iron steamship *Marana*, of 1,682 tons, bound from London to Colombo, with a cargo of sleepers. She was observed by the Start light-keepers to go ashore, at sunset, on the Blackstone close by, when the wind was of hurricane violence from the north-east. Neither telegraph nor telephone

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was at hand, so a messenger was despatched to the nearest coastguard station, one mile and a-half away, to request that another messenger should be sent to Prawle, for the rocket apparatus. Before help could be afforded the stricken ship, her crew of 28 left for the shore in two boats, which eventually capsized, and only three men survived to tell the tale. Had the Start been in electric communication with Prawle, it is not improbable that this loss of life might have been avoided. Several well-seasoned small craft foundered in the same gale. The oldest of the eight thus accounted for were the *Martha*, 54 years, and the *Henry*, of 79 years. The largest was a barquentine, the *St. Halvard*, 284 tons, which foundered in 50° N. 10° W., while bound from Newport, Mon., to Mexico, with coals. One small steamer, the *Neptune*, proceeding from Guernsey to Dover, with granite, foundered off Portland, with the loss of two lives. It will thus be seen that, in one unexpected gale, 26 sailing-vessels and one steamship were missing; 25 sailers and 3 steamers stranded; 7 sailers and 1 steamer foundered. In other words, 30 per cent. of the ships missing during 1890-91 disappeared in the so-called blizzard of March, 1891.

No better weather forecaster exists than the hardy coasting skipper, for as Fenimore Cooper, in his fascinating nautical yarn, entitled "The Water Witch," puts into the mouth of that gallant seaman, the Skimmer of the Seas, "Your true seadog, who runs in and out of inlets, is a man of marvels. They know the colour of the sea at night, and are for ever steering in the wind's eye, in search of adventures. I wonder more of them are not kept at making almanacs. There was a mistake concerning a thunder storm in the last one I bought, and all for the want of proper science." The famous freebooter was evidently not familiar with the true and trite Danish proverb that the almanac-maker makes the almanac, but God makes the weather. The Government Meteorological Office forecast, issued at noon of the 9th for the succeeding 24 hours, was as follows:—

District.	Winds.	Weather.
0.	N.W. to W. fresh.	Unsettled. Some snow.
1.	W. moderate.	Fair generally.
2.	N. light.	
3 to 5.	N.E. modte. or fresh.	Snow showers in places. Fair generally.
6.	Variable airs.	
7 and 9.	E. moderate.	
8 and 10.	E. fresh or strong.	

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No storm warnings were issued, and the British forecasters coupled up with our westernmost ports and the coast of France gave it as their opinion that the anticyclone over our islands seemed to be spreading south-eastwards, and improving weather was therefore probable on our southern coasts. Temperature, however, was likely to remain low generally. The French weather forecast for the same period was that strong or very strong winds between East and North would be experienced in the English Channel. At 2 p.m. of that day an easterly gale was blowing at Valentia, an east-north-easterly gale at Scilly and Jersey, and a southerly gale at Rochefort. The tiny craft caught in the toils were struggling for very existence against the bitter blast ere the ink was dry of the State paid predictions. From the state of wind circulation and atmospheric pressure at 8 a.m. and 6 p.m. of the 9th, as given in the Weekly Weather Report for that period issued subsequently by the Meteorological Office, it appears that at 2 p.m. the coming blizzard was central somewhat north of Cape Finisterre, and at 6 p.m. near Jersey. Soon after it had reached our south-west coast, despite the forecasts to the contrary. Captain A. Haggard, of the King's Own Scottish Borderers, was at South Raglan Barracks when the centre passed. At 8h. 12m. p.m. the storm raged furiously; at 8h. 13m. there was a complete cessation of the windy war, and for 13 minutes matches burnt readily in the open air; at 8h. 26m. the gale renewed the attack with roars of thunder; at 8h. 46m. there was another lull for about five minutes, and then the blizzard made itself manifest even worse than before. The gale kept on all night. By 8 a.m. of the 10th it had passed up the English Channel, and was central off Cape Gris Nez. Another cyclone near Brest seemed likely to cause a removal of the bad weather over our southern coasts, and there were also indications of fresh disturbances in the north. The second cyclone was central on the 11th, in about the same position as the blizzard on the previous day, and on the 12th lay over the Scaw. The north cone seems to have been hoisted, but too late to be of any use to seamen on the 9th, in districts 2, 3, 5, 8, 10, and part of 7. During this gale the Hamburg American Company's steamship *Suevia* had a very bad time. She passed the Lizard outward bound on the morning of the 9th, and at 3 p.m., not far distant, was disabled in a blinding snow storm. Sail was made as quickly as possible, and the ship kept away from the coast. After drifting hither and thither for five days she reached Plymouth in safety.

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In one other gale, that of 5th and 6th November, 1890, ten coasting craft and one steamship were posted as missing. Seven of these sailers were less than 100 tons register, and the average tonnage of the ten was only 79. Their average age was 31 years, and the two oldest, the *Royal William* and the *George Canning*, were 56 and 46 years respectively. They carried about 4·4 men per hundred tons register. The missing steamship *Whitehall*, an iron vessel of 357 tons register, was bound from Bilbao to Garston with a cargo of iron ore, and is supposed to have foundered after collision with the steamship *Lough Fisher*, during the gale of the 5th, near the Smalls. A steam trawler, the *Dolphin*, is reported to have brought to the surface in her trawl, when 16 miles south-west of the Smalls, a ventilator, some ore, a piece of woodwork, and a seaboot, which were landed at Milford Haven on 19th November, 1890, and identified as belonging to the missing *Whitehall*. During the previous September, a steam trawler near Montrose brought up in her trawl some wreckage belonging to unknown missing ships. It consisted of portions of a small vessel's keel, and of another older craft in which the copper bolts were very different from those in use for many years past. Mixed up therewith were pieces of a trawl belonging to some unlucky fisherman, who had previously fouled the wreck to his great loss. In January, 1888, a collision occurred between the fishing-smack *Nimble* and another vessel, when William Shears, the smack's skipper, was knocked overboard and drowned. A smack named *Telegram* soon afterwards drifted close by with her trawl down in blissful ignorance of the disaster, and gathered up the dead body of the missing skipper in the trawl. Quite recently, a brand new tug-boat, the *Secret*, is reported to have disappeared while coming round to London from Hayle. She has not been heard of since leaving the latter place on 25th October, with a crew of six men and three gentlemen passengers. Subsequently an advertisement appeared in a shipping paper offering a reward of £50 for information respecting one of the passengers named Pohl. On 12th November the remains of a man were landed at Tenby from the trawler *Come*, which had been secured in her trawl near Lundy, and are supposed to be those of the passenger referred to above. Hence it will be seen that occasionally the sea gives up its dead, and thus enables the fate of a missing ship to be determined with some degree of accuracy. Twenty-one sailing coasters were stranded by this gale. One of them, a 50-ton

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yacht, the *Urania*, lost near Bangor, had her owner, Viscount Cantelupe, on board, and he alone perished. The average age of these stranded vessels was about 30 years, and their tonnage 120. A smack, the *Linnet*, was 70 years old, and eight of the other vessels had buffeted the waters around our coasts for periods varying from 30 to 50 years. Their manning scale was at the rate of four men per hundred ton register. H.M.S. *Serpent* went on shore at Cape Villano, Spain, on the 10th, when out of a crew of 176 officers and men but three were saved. Probably the heavy gales of the previous days had driven her to leeward, and at the same time caused an abnormal current towards the "merchant marring rocks," where many a goodly merchant ship has been beaten to fragments by the surf. From the record of the wind systems and barometric pressure at 8 a.m. on the 5th of November, 1890, as given in the Meteorological Office Weekly Weather Report for that period, the forecast issued at noon of the 5th for the next 24 hours was as follows :—

District.	Winds.	Weather.
0 to 3 and 6	... N.W. to N., fresh or strong	... Fair generally, local showers.
4 and 5	... N., fresh	... Fair generally.
7 to 10	... N., strong to moderate	... Fair generally, local showers.

No warnings were issued, but the probable changes in the system then prevalent were given. It was supposed that an anticyclone was apparently spreading over our islands from the westward, that the strong northerly winds in the west would soon subside, and that fair cold weather would prevail over our islands for a time. The French forecasters were of opinion that the wind in the English Channel would be between west and north, very strong to strong. At 6 p.m. the wind at Cape Gris Nez was N.N.E. 7 of Beaufort's scale 0 to 12 ; at Brest, N. 7 ; at Cherbourg, N.W. 9 ; and at Ushant, N. 9. A cyclone, lowering the barometer readings from 29·9 inches to 29·4 inches, had made its appearance on the west coast of Ireland instead of the system of high barometer that misled forecasters on the previous day. Hence it will be seen that the act of God, as the insurance companies say, has much to do with missing ships, at least, around our own coasts.

There were twelve other coasting craft that disappeared at various times throughout the twelve months embraced by the Board of Trade Wreck Abstract, and doubtless heavy weather was the principal cause of the disasters. The average register

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carrying capacity of these ships was only 86, and their age 26 years. Included among them were a Thames sailing barge, bound from Dusseldorf to London with bottles; a 4-ton yacht, the *Swan;* and two small fishing smacks. Such vessels all help to swell the total of missing ships and to point the moral of a popular agitator.

Twelve sailing-vessels, averaging 102 tons register, were missing while coasting abroad, principally in North America and Australia. Two iron steamships, one of 57 and the other of 814 tons, also left no trace in Antipodean waters. The average age of these Colonial coasters was only 15 years, and their manning scale about 5·5 per 100 tons register. Three of them were between 25 and 35 years old. One, the *Bloomer*, a 39-ton schooner, was lost so far back as December, 1885, while on a passage from Cape Breton to Newfoundland. Having thus far escaped the notice of the wreck compilers, it might have been better to have dropped her altogether.

As a rule, when mention is made of a missing ship, the mind instinctively reverts to some large sailing-vessel under a press of canvas, heeled over before a sudden squall and capsized in mid-ocean; but, actually, the missing list is composed of small coasters, and ocean-going vessels are conspicuous by the smallness of their numbers. Only 23 sailing-vessels and 3 steamships making deep-water voyages were posted as missing during 1890-91. The average age of the sailers was 16 years, and their register carrying capacity 940 tons. The two oldest were the *Laura*, 30 years, and the *Atossa*, 28 years. The iron barquentine *Lake Fisher* was a new ship; the iron ship *Lord Raglan*, 2,078 tons, was only 4 years old; the *Malaysia*, one year older. Some cause other than faulty construction or overloading must be found for the disappearance of such splendid ships, and this may possibly be traced to the scantiness of their crews. The manning scale of the deep-water missing sailing-ships, was only at the rate of 1·9 men per hundred tons register. In 1884 the late Mr. Thomas Gray pointed out, by means of a Board of Trade circular, that the number of seamen carried in proportion to tonnage is getting less every year, and indicated that the Board proposed to direct attention to manning in every wreck enquiry. Competition among British shipowners themselves, and between the various maritime nations, is so intense, that crews would almost appear to be a secondary consideration. Soon after the issue of the circular referred to above, several

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ships were adjudged by nautical assessors to have been undermanned; but since then this important question would appear to have passed out of view. The *Shannon*, a well known sailer, of 1,621 tons, disappeared while on a passage from London to Calcutta, in 1885. Assessors held that her crew of 28 hands, all told, was insufficient. Nevertheless, this number was much in excess of the numbers carried by several of the ships missing in 1890-91. The *Port Chalmers*, of 1,500 tons, stranded in 1885, and the assessors were of opinion that she was too lightly manned with a crew of 18. Other instances are not far to seek, if space permitted. Returning to Mr. Swanston's latest list of missing ships, we find that the *Lord Raglan*, 2,078 tons register, had a crew of 28; the *Malaysia*, of 1,827 tons, had 30; the *Lansdowne*, a wooden Nova Scotiaman, of 1,486 tons, had 18; and the *Raven's Hall*, of 1,584 tons, only 20 all told. It will be noticed that the *Shannon* compared favourably in respect to number of crew with these instances; yet undermanning was not held to exist. Moreover, the disparity between the manning scales of various owners is most marked. For example, the iron barque *Deanfield*, 1,072 tons, had a crew of 20, or exactly the same number as perished in the *Raven's Hall*, of 500 tons more register. Similarly, the *Roman Empire* and the *Glenfinart*, of about 1,500 tons, each carried a crew of 30 men; whereas, the *Lord Raglan*, of 2,078 tons, only carried 28. Captain J. McKirdy, R.N.R., speaking on a paper recently read at the London Shipmasters' Society, rightly said that the question of undermanning overtopped all the other causes which tend to make a life at sea less worth living. Of the three steamships missing, one was only two years old; and another, the *Thanemore*, was probably lost owing to fire in her cotton cargo.

Then, again, the introduction of so many foreigners into our Mercantile Marine may have a direct influence upon the number of shipping casualties. The *Helen Finlayson* was lost in 1886, and the Court drew attention to the fact that her crew were all foreigners and insufficient. Many of our readers will have been shipmates with foreigners who, although doubtless excellent seamen, were ignorant of the most elementary terms of the English language. Herein lies death and disaster. In 1889 the *Loch Torridon* stranded east of Mutlah Light. A look-out, named Olsen, and Engels, whom he had relieved, both saw that the colour of the water had changed, but made no report thereof. The magistrate in his

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report animadverted on the evidence of these two witnesses. He said that they were both Norwegians, speaking English so indifferently that he could not understand what they meant. Lascar crews are seldom found in British sailers; but their record in steamships is not all that could be wished, especially when danger threatens. Then it is that men of British descent will follow a leader into the very jaws of death while the Lascar shivers and resigns himself to the decree of fate. Negro crews have also been tried and found wanting. Captain Samuel, of the celebrated American clipper *Dreadnought*, writes in his interesting autobiography that coloured crews are very well in fine weather, but worthless in cold, stormy weather, and he experienced a great difficulty in keeping them in motion, lest they should freeze to death as they stood. Neither foreigner nor coloured person would be available to man our war-ships should that dread necessity arise, and this is a consideration not to be denied.

We have often wondered whether it would be possible to devise a system whereby information with respect to the disappearance of a ship might be ensured. Mr. G. A. Laws once suggested a hollow metal globe, one foot in diameter, coated with red vulcanite or rubber, which should be at once strong, light, arranged to float when less than half immersed, and contain papers so as to float off as the ship went down. It is said that a bottle from the *London* conveyed news of her sad fate to loved ones at home. Mr. C. D. Elliott, of Trinity College, Cambridge, found a bottle on Brighton beach containing a paper, bearing the following message:—"11th January, on board the *London*. We are just going down. No chance of safety. Please give this to Avonia Jones, Surrey Theatre. Gustavus Vaughan Brooke." The last wishes of the famous actor were complied with, and the document forwarded to his wife. When the *Kent*, East Indiaman, was burnt, an army officer, the father of "Rob Roy" McGregor, wrote a hurried message in pencil on a scrap of paper, which was put into a bottle and committed to the deep. Nearly two years later it reached the sender from Barbadoes, having been picked up by a bather there 30th September, 1826. The writing was still legible, although the paper itself was somewhat stained. The message is worthy of reproduction here:—"The ship, the *Kent*, Indiaman, is on fire. Elizabeth, Joanna, and myself commit our spirits into the hands of our blessed Redeemer. His grace enables us to be quite composed

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in the awful prospect of entering eternity. D. W. N. McGregor, 1st March, 1825. Bay of Biscay." Undermanning and the employment of foreign seamen probably have much to do with the disappearance of sea-going merchant ships, and it is high time that some satisfactory scheme were arrived at, so that greater safety may result. We hear on every hand that the British seaman is degenerating, yet it is certain that the number of men carried per hundred tons register is dwindling away still more rapidly. How can these two statements be reconciled? Labour-saving appliances, and the substitution of four masts for three, do not suffice. Nevertheless, having regard to the magnitude of our merchant fleets, and the increasing number of voyages made yearly in each ship, we are decidedly of opinion that owners of sea-going carrying craft are to be congratulated on the immunity of their ships from disaster. The crews are also to be complimented for sterling seamanship, which pulls them through despite overwhelming odds. Uncertainty of our weather is the principal cause of disaster to the tiny craft that trade around our coasts, and this trouble will remain with us.

METEOR.

THE NEW RIG FOR "FOUR-POSTERS."

THE voice of the seaman is slowly—and none too soon—being heard in the matter of the rig of the modern, monster sailing-ship. It would be interesting to know in how many cases the simple heeling experiment has been applied to these giants with all their spars—especially royal and skysail yards—aloft; sails bent and gear rove. Possible some head draughtsman might be found to say: "Oh, it is not necessary." Is this the seaman's idea? We think not.

Said a practical seaman to the writer, only a few days ago: "These large iron ships are running away with their crews; the manning of them is a pressing matter." It is quite a question whether the *France* is sufficiently manned with a crew (*all told*) of 46, or whether the *Andorinha* is so with a crew of 40. Would it not be open for a surveyor to declare in these cases that such a ship with the rig these vessels have could not proceed to sea without, in the phraseology of the

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Merchant Shipping Act of 1876, "serious danger to human life?" Take the last-named vessel, and, presuming her to be manned as British ships usually are, we should find master, two mates, six apprentices, cook, steward, leaving of seamen before the mast 29; total 40.

Under ordinary circumstances, in fine weather, she would possibly have on deck at night one mate, two apprentices, and 14 seamen. Could such a crowd handle her in a dark tropical night in a smart squall? The question may safely be answered in the negative.

Imagine the scene. These nights, when the fringe of the squall cloud reaches the vessel, are "as dark as a pocket." The rain comes first; Tom hasn't got his oilskins, and sneaks below for them; no one can possibly miss him, it is too dark. Bill is at the wheel; Yon Yonson is on the look-out, and means to stay there under the lee of the windlass. One of the youngsters is on the sick list.

This leaves us with eleven men, one apprentice, and the mate of the watch.

It is two in the morning. The skipper went below at six bells in the first watch—it was then as fine a night as could be imagined, but as the moon went down it began to cloud over a bit. "Let me know if it comes on dirty," said the old man as he went to turn in; but the night can hardly be termed "*dirty*," there was one little gust an hour ago, but nothing to notice. The four royals are set and all the light staysails, there has been no reason for taking them in. Mr. Newcome, the second mate, who is on watch, has never sailed in a "four-poster" before, let alone a *five*-poster. As the rain begins to drop he looks to windward and wonders "if there's anything in it." He would *like* to lower the royals down, but it would take the rest of the watch to hoist them again. He would *like* to call the skipper, but he would be annoyed if there turned out to be no wind in it. He knows these squalls are sometimes "hot." He has a book on Seamanship down below that would tell him that (speaking of squally weather near the equator)—

"It is very dangerous to carry a press of sail as these squalls are of such unequal strength; one comes that looks a heavy squall, which may turn out to have very little wind in it; where the next, which looks to have little or no wind in it, may have energy enough to put the top-gallant masts over the side."

He will chance it.

"Stand by your royal halliards!"

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An answer comes from the main-deck in the weak squeaky tones of a modern "able" seaman, "Stand by the royal halliards, sir!"

Now, what shall he do next? Shall he go aft and stay by the man at the wheel, who is boxed up in a closed house right aft; or shall he stay at the break of the poop? He wonders if the man at the fore-royal halliards could possibly hear him if he sang out "Let go!" He wonders if there *is* anyone by them. He wishes some of these stay-sails were off the ship.

Down comes the squall!

It is one of the dangerous ones. She lies down, down, down. Is she never going to stop!

"Let go the royal halliards!" Aye, my boy, and the top-gallant halliards, too. Run aft and get the helm put up. No need to *call* the skipper now; he is up in his pyjamas. What's to be done? He knows not. The long brute of a tank sticks to the wind (the 360 feet of her). He knows he could not cut away if it was ever so; the iron screws in place of lanyards prevent that. She goes over, over. Too late!

Is this an imaginary picture?

We have said the voice of the seaman is being heard. Yes. The first enlightened gentleman who took the matter up was the marine superintendent for the firm of Messrs. Robert Shankland & Co., who own a very fine fleet of sailing ships. This gentleman's idea was to decrease height of spars and make up the sail area in breadth. The new rig was double top-gallant sails *and nothing above*. The matter was brought into prominence by an article which appeared in this Magazine some two years ago. At first other firms laughed at it; the rig looked ugly; unwieldly; not "swagger" enough. The report of their officers told a different tale. "Swagger! Who cares for swagger?" The ships can be *handled*. If a sharp squall *does* come down, there are eight flying kites the less to look after (four royals and four sky sails), all we have to do is to lower the top-gallant sails and she is snug. Nothing set above the top-mast cap. Is'nt that worth a good deal of "swagger?" especially in view of the number and *kind* of men we get nowadays! There is no doubt that a vessel, like Messrs. Shankland's *Kilburn*, for instance, which served as the text for the above-mentioned article on this subject in the *Nautical*, would be far more easily handled in a squall with six men on deck that such a ship as the *France* or *Maria Rickmers* with three times that number. For suppose these ships, with royals and sky-sails

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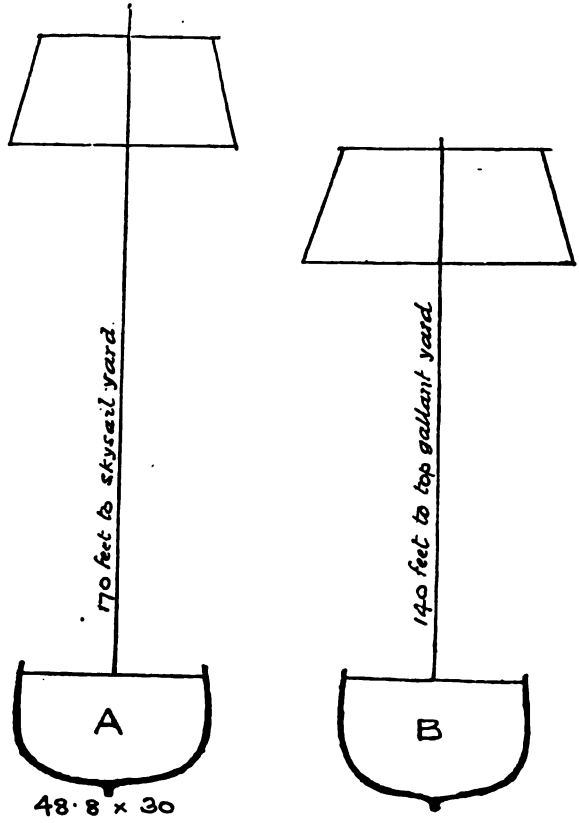
lowered; they are "slatting" and flapping about with a noise like thunder, they must be cleared up and so on, whereas the upper top-gallant sails may lie where they are through a dozen squalls and take no hurt. Then look at the immense superiority in the point of "stability." Is it nothing to be able to carry some 5,000 yards of canvas 25 or 30 feet lower down? This new rig has already so fully proved its superiority that many other firms are now—their laugh over—adopting it. Even such a conservative old seaman as Captain Clink has rigged his last new ship, the *Yarana*, thus. And the superiority will be shown in her passages. Ships rigged thus can be carried on too in squally uncertain weather. The great advantage of this is apparent to every seaman; besides being doubly safe with a homogeneous cargo, supposing, of course, the design is a good one.

Take a rough sketch of two similar ships of the *France's*



dimensions, breadth 48·8, moulded depth 30·0. Suppose, with the rig of four royals and skysails, the height of the

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skysail yard from deck was 170 feet; no great height for a ship 360 feet long; and that with the double top-gallant sail rig the height of the upper yard from the deck is only 140 feet. The great advantage from the "stability" point of view is at once apparent. What a vast amount of leverage the upper sails of A. must exert over B.'s upper sails.

It is well known that bad accidents, such as dismasting, going on beam ends, and so on, have happened to these lofty, over-sparred, under-manned monsters. Some, alas! are missing, gone with all hands.

A sailing ship of 2,500 tons with the new rig can be handled. It is a question whether this tonnage is not quite large enough, and whether, when ships reach the size of 3,800 tons, they are not too unwieldy for any rig to make them handy.

W.

"FEDERATE!"

(COMMUNICATED.)

IT appears to be universally admitted by masters and officers generally—except those who, in a snug berth in a first-class company, forget their less fortunate brothers—that things are not as they should be in the merchant service. The general opinion seems to be that our social and educational status and pay are lower than they used to be in the "good old days." Now *this* is scarcely correct. However much we may rail against the present state of things, about the faultiness of the examination system and so on, it is only the uninformed who rave about our inferiority to the "old sea dog." Let anyone who doubts this take the trouble of looking up the state of things fifty years ago, when Merchant Shipping Acts, as we know them, were non-existent; he will find the "tramp" shipmaster of those days totally uneducated, unable in many instances to write a letter; blissfully ignorant of any of the higher branches of navigation; in receipt of pay perhaps equal to the second mate of to-day, and commanding little wooden vessels which, in these times of supervision, would not be allowed to leave port—said one of these old seamen to the writer.

"Unseaworthy ships! Why the boats you see detained in these days would have been palaces when I first went to sea.

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Many a time I've been across to Hamburg in the winter with a craft that leaked so much that we would often find her with four or five feet in her lying here quiet in dock after leaving her lie loaded for one night."

We may imagine what sort of craft that would be in a seaway. It would be easy to point to other directions in which there is to-day much improvement. And there is no doubt that, taking the "tramp" of to-day and comparing her with the vessel which, fifty years ago, did her work, there is improvement in the social status of the master, in his pay and feeding, in his accommodation and comfort generally, and in the vessel he commands.

But, taking all this for granted, it is no argument against the necessity for striving to improve ourselves and making the life of a tramp shipmaster less of a life of hardship and nervous tension. Everyone in these days is, or ought to be, reaping the benefit of advanced legislation, and there is no reason why, in this direction, the seaman should be passed over; why, because he is much away from land, he should—for instance—be debarred from his fair share in the educational advantages which his more fortunate brothers on shore possess.

A paper touching on these subjects was read at the London Shipmasters' Society, in October, by Mr. W. Allingham, which is worth the consideration of all merchant seamen anxious to make things better in the noble service to which they belong. It can scarcely be called pleasant reading, but is calculated to make us all *think*.

Of one thing there seems to be no doubt, and that is this. The shipmaster of to-day must take care, or his position, not worth much even now, will soon be one not worth having to a respectable man. One comparison will suffice to prove this. Let us take a man in a shore berth, having nothing to do with ships. He must hold a Government certificate of competency for the position he occupies, and must have served so many years at his business, and have passed periodical examinations. By care and good conduct he has risen to a position of responsibility to Government, and has under his sole charge property to the extent of say £50,000, and is the head of an establishment of some 30 people. Now what would such a man's position be worth? I think we may say at least £400 a year, in addition to which, he would enjoy the comforts of home, the respect of the community he lives in, and, if his ambition ran that way, might possibly

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become a town councillor or churchwarden. Is the modern tramp "skipper" in a similar position? If not, why not? The answer *still* unfortunately is, that the managing owner considers his vessels merely as money-making machines, and also because *he* runs no risk, and it matters nothing to him who is in charge of his floating capital, *for he is insured.* There are managing owners, plenty of them, with only *one* share in the vessels they run; it is quite worth their while to MANAGE. "With primage and average accustomed," and other pickings, they feather their nests and do not care so very much whether ships float or not so long as a dividend is procurable. Directly there is any show at all they order another ship, and so the cut-throat game goes on. Under such circumstances it is hopeless for the seaman to expect from shipowners any help towards improving his position. The few who would help him are in a minority. To himself alone he must look. Can he do anything? Yes. How? Marry! thus: FEDERATE!

All the true emancipations in the world's history have been due to federation. Shipmasters, being trodden underfoot by the managing owner, must federate against him. It is the only way which points to liberty, and it seems strange that shipmasters have not even begun to learn the lesson. Someone will say, "Why! what are you talking about? Is there not a federation of shipmasters' and officers' societies?"

"Yes, my dear sir, *so-called,*" but no more truly federated than Newfoundland and Canada, as an instance, have been in past years. Such spurious federation is nothing but a source of weakness and jealousy. Hence the managing owner can sit quietly and laugh in his sleeve at it.

True federation requires an *elected* general council, or some similar machinery, *responsible* for public and general, as distinct from local business, which council should be elected at stated intervals by ballot of the whole of the members. This is the vital principle of federation. History gives us quite conclusive lessons on this. If the earliest federation, that of the Rhodian combination over 2000 years ago, had not provided a head centre in Rhodes, their union would have been powerless against attack. The great republics of Italy never became a corporate body, jealousy and rivalry were always present amongst them, and in the end they destroyed themselves. On the other hand, the Hanseatic League of the thirteenth century is a great example o success. They began combina-

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tion at Wisby by keeping a common treasure in the hands of aldermen from the chief cities; and by further close combination became the most powerful rulers of the middle ages, dictating terms even to Emperors and Kings. The importance which enlightened modern thinkers attach to the principle has been shown by the Americans, who thought a most bloody and fratricidal war not too heavy a price to pay for it. True enough, the still more modern cries of "Wales for the Welsh" and the rest, point to less enlightened ideas. Let not shipmasters be led away from common sense dictates by any such fatal nonsense. Federation which is not federation; federation which combines with a ruling antagonistic power—we need not speak plainer—will never be sufficiently powerful to attain its ends. Some small good it may, and possibly will do; but things are in a serious way and heroic remedies would seem to be the only ones likely to be effective. A true Federation of shipmasters, with a strong elected committee representing them, would be able to force legislation. But whilst Liverpool, London, Leith, Glasgow and Sunderland pose, chiefly through their secretaries, as the representatives of the merchant service; whilst at the same time they are not even properly combined, they will neither command universal confidence through the service, nor bring strong enough power to bear on Parliament. Is this last statement too strong? Let anyone who thinks so (not being a Liverpool man) read through the stereotyped advertisement of the Mercantile Marine Service Association. If this does not convince him, let him enter into communication with the Secretary of the Association, and also with the Secretary of the London Shipmasters' Society, and if he can read between the lines he will see that both are anxious for him to become—not a member of a Federation—but a member of *their society*. Is it needful to say more? Here is *the point of the situation*. Until local jealousies merge into true federation the shipowning interest will be able to "play" with Shipmasters' Societies. They will pose as candid, cordial *friends*, but will certainly not take any steps to raise the status of the "tramp" shipmaster. They have had a couple of years to act if they had intended any such course. Have shipmasters benefited during that time? The real truth is that the interests of the managing owner and his shipmaster are not identical, and no maudlin friendship will make them so.

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The paper referred to above shows, in lurid light, many of the modern abuses which cry aloud for rectification; and shows how little shipowners are to be trusted with their rectification. Take one instance—under-manning. A shipowner, under examination before a Royal Commission, can be found who will seriously state that three men are put on board for every 100 tons!!! and yet the *A*——, of 3,500 tons, will go to sea with a crew of 40 to manage her four masts, a quarter of whom are boys; whilst a steamer, the *B*——, of 3,500 tons, only carries, all told, 22 men. This is *gross* tonnage, the only figures which give the actual size of a vessel; register tonnage is unmeaning and misleading.

The foreigner question also calls for settlement; everything is tending to larger and fewer ships, sail and steam, with smaller crews and a greater percentage of foreigners. In fact, the pressing questions are many, and if our shipmasters, as a body, remain asleep, they will in a few years more find their position too far gone for rectification. These thoughts are submitted to members of the various unfederated societies for their consideration. Times are serious enough, of that we, who nurse the weary tramp, are all convinced. Stick to the sea many of us must. Divided we can, we dare, do nothing. *Completely united* we should be a real power to better ourselves and the service generally.

And is nothing wanted in the way of cleansing our own nest? Each one of us can point to some man or other who brings discredit upon the service to which he belongs. At present there is no power strong enough to say, "Mend your ways, or out you go!" No power ever will be able to say so, unless it is ourselves. At present, membership of the Shipmasters' Societies is not so run after that room cannot be found for all applicants; and why? Simply because, under the present *régime*, membership is not of much value, and, until a great change is made, it will remain of little value. But suppose federation to have been brought about—suppose we had taken a leaf out of the example book of the Shipping Federation—what a change we should see. A powerful corporation elected by ballot; a strong society in each principal port; a body important enough to say to the managing owner, "Our members have decided that you shall not engage a shipmaster who is not a *bonâ fide* British subject; a man of unquestionable character; a man who holds our certificate of competency as a navigator, a practical seaman, and a man of business; this man

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must be treated fairly and squarely by you, and '*none of your nonsense!*'" Is this a dream? "Are visions about?" as our American friend says. It is a dream, the fulfilment of which lies in the hands of shipmasters and officers in the service, and in their hands only.

CORRESPONDENCE.

[We have received the following communication from an esteemed correspondent, and without at this moment commenting upon it, we print it for the consideration of our readers.—Ed. *N.M.*]

NIGHT SIGNALS.

To the Editor of the "Nautical Magazine."

Sir,—I am glad to see by the two last issues of your valuable magazine that the code of night signals, which you kindly inserted, has had one good result, namely, of provoking criticism and discussion. I sincerely hope it will lead to the adoption of some code of night signals by the Board of Trade, as it is, I think, quite a necessity that there should be some means of night communication in the merchant service.

I agree with your two correspondents, Lieut. Everett, R.N., and a Sub-Lieut. R.N.R., in that there is no such efficient code as the "Morse," and I have seen it in daily use for some time; but the operator requires a thorough knowledge of it, and constant practice in it to use it efficiently. If in the merchant service we carried qualified signalmen, with nothing else to do but make and receive signals, the "Morse" would undoubtedly be the best code to adopt. But in a merchant ship the officer of the watch requires either to make the signal himself, or direct the making of it; and it was knowing this that I suggested a code resembling as much as possible our flag code, and to be used with our signal book. Simplicity is, I am perfectly sure, one of the first things to be considered in the adoption of a night signal code, and I do not think that simplicity is one of the features of the "Morse" code, although I grant that with thoroughly skilled operators it is a splendid means of communication. The code which I proposed is arranged exactly in the same way as the Semaphore signals now in use in the merchant service, and of which

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knowledge is required by the candidate for a second mate's certificate of competency.

With regard to the Indian Marine grievance, I should say that your suggestions in this month's issue should at once be acted upon, namely, of having printed pamphlets sent to Members of Parliament, containing an account of the whole unfair business. I am quite a junior in the Reserve, and shall therefore leave further suggestions to senior men, but I think, after the able letter by a "Retired Lieutenant R.N.R." in this month's issue, that all Reserve officers will see that organisation is the only thing to make the Royal Naval Reserve what it ought to be.

I shall be glad to guarantee a fourth of the sum you name for printing the pamphlets, if necessary, and with apologies for trespassing on your valuable time and space,

I am, &c.,

IRWIN HAYWARD, Lieut. (acting) R.N.R.

H.M.S. *Hecla*, Malta, 26th October, 1892.

HOW ARE NAUTICAL ASSESSORS APPOINTED?

To the Editor of the "Nautical Magazine."

SIR,—As the above subject is of very great importance to all those who go down to the sea in ships in the capacity of masters or mates in the merchant service of this country, I propose to ventilate the question in the hope that the subject may be taken up by other and abler pens than mine, and that the ball, when started, will be kept rolling until a more satisfactory state of things than that at present existing is brought about. The shipowner is also an interested party, although not to the same extent as the unfortunate master or mate whose conduct is brought in question. Under certain conditions he is responsible for the acts of his servants, and may suffer pecuniary loss through the action or advice of careless, incompetent, or prejudiced assessors.

As the law at present stands, the conduct of any officer holding a certificate from the Board of Trade may, in case of accident to his ship, be enquired into before a magistrate, police or other, possibly without any nautical and very little legal knowledge so far as ships and sailors are concerned. It is, therefore, of the utmost importance that those who advise the judge, whoever they may be, on technical points, should,

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like Cæsar's wife, be above suspicion, both as to professional ability and *bonâ fides*.

As matters are at present, is that so? If the opinions of all those most deeply interested in the question could be taken the reply would be unhesitatingly, No!

There are, no doubt, many able and honourable gentlemen on the list of assessors. But if there are also some to whom such titles would scarcely be applicable, the question arises, by whom are nautical assessors selected and appointed? Do the qualifications for such appointments consist of a first-class record of professional ability, conduct, and sobriety, as well as ripe experience? I think not, and I say confidently that many of those now employed as nautical assessors do not, and never did, possess any one of the above qualifications; some there are whose professional ability or whose conduct on shore would not bear investigation, while there are others who, when afloat, were a bye-word and laughing-stock to their professional brethren either from their ignorance, timidity, or other unseamanlike qualities. Some recent decisions in cases of loss or stranding have been so manifestly unjust and against evidence, that they have been reversed on appeal. But few officers in the merchant service, after having undergone the first ordeal, have either the means or inclination to go into the Appeal Court, although smarting under a keen sense of injustice. Many such instances have come under my personal knowledge, and it is with a view to rendering the necessity of such appeals less frequent, by the appointment only of nautical assessors in whom the public and the nautical profession have full confidence, that I now write. I would suggest, that as a preliminary step, all owners and officers who belong to societies should press upon their representative committees the urgent necessity of thoroughly ventilating this question, at the same time, consideration might be given with a view to the alteration of the law in this respect. As to whether or not a police court is the proper tribunal to enquire into marine casualties. In my judgment it is not. I may add that I have never been a candidate for an appointment as nautical assessor, so I am not open to a charge of crying "sour grapes." I have held a master's certificate since 1863, which has only once been called in question under the following circumstance. During the Abyssinian war of 1868, when in command of a hired Government transport, my vessel having met with an accident, and being in a foreign port; as

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the best means of putting myself right with the owners in England, at my personal request, a Naval Court was ordered by the principal transport officer, the present Admiral Sir George Tryon, K.C.B. The finding of the Court, which consisted of a Staff Commander R.N. and two masters of merchant vessels, being that I was free from blame for the casualty, so that I have no personal grievance against the existing state of things, nor do I write with the sword of Damocles suspended by a rotten rope-yarn over my devoted head. Having coiled my ropes up, I have not the fear of being haled before any nautical tribunal, either competent or the reverse, but I still take the liveliest interest in all that concerns the welfare of the British merchant service, in which I spent the best years of my life, and which I think, chiefly from want of proper representation, meets with scant justice in the matters alluded to.

There is yet another point on which I think the Mercantile Marine has just cause for complaint and dissatisfaction. I allude to the very large proportion of Royal Naval officers now employed as assessors. These officers are either retired on pension or on half-pay, and are also eligible to many posts and appointments for which the officers of the Mercantile Marine are not eligible. There are exceedingly few posts open to the latter, who as a rule are so poorly paid as to be unable to make adequate provision for retirement when no longer competent to carry on the active duties of their profession. This is not by any means a sentimental grievance, but putting it aside altogether, I consider that Royal Naval officers, unless with personal experience of working and handling merchant ships and steamers, are not the most competent experts to advise the judge or magistrate in cases of casualties to merchant vessels.

The difference between one of Her Majesty's ships with her numerous and highly-disciplined officers and crew, and with all the most modern and best appliances of navigation, &c., and the undermanned, deeply laden, and often badly-found merchant vessel, is great; and equally great are the modes and possibilities of working them. Under certain circumstances, what would be gross negligence on the part of the captain of the former, may be an absolute impossibility to the latter. I need hardly inform any of your readers, nautical or others, that a very frequent cause of marine casualties is the neglect of the use of the lead in narrow or dangerous waters or when approaching

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the land at night or in thick weather. Take the tramp steamer, for instance, many of which of large size are now trading to almost all parts of the world, the deck crew consisting of no more than eight hands, which means only four in each watch, without providing for any being on the sick-list, one man at the helm and one on look-out, leaves just two hands to carry on the work about the decks, trim the lamps, &c., which is not sufficient to get a cast with the ordinary deep-sea lead. So the master, although anxious as to his position, waits till the change of the watch when all hands (six) will be on deck and enable him to use the lead; possibly before this time arrives the ship is on shore and may be a total loss. The same applies to the sailing-vessel, when in stormy weather it is often necessary to have all hands on deck to shorten sail in order to heave-to to get an accurate sounding with the ordinary old-fashioned deep-sea lead and line. I am now alluding to a class of vessels where the owners are too niggardly to supply Sir W. Thomson's (Lord Kelvin), or some similar apparatus, by which accurate soundings may be taken in 40 to 50 fathoms without reducing the speed below 10 to 12 knots. I have frequently taken as many as six accurate casts in an hour with it with only two hands beside myself when entering the English Channel in thick weather, while running at 10 knots per hour.

I hold a very strong opinion that this apparatus or some similar and equally efficient one, if such there be, is as essential to the safety of the vessel and the lives of those on board as the side-lights, the fog-horn, or the life-buoy, and I trust that ere long it will be made compulsory by law as a part of the equipment of all sea-going vessels, sail or steam.

In making the foregoing remarks, I must disclaim all intentions of casting any reflection on the officers of H.M. Navy; in their own sphere no better or more scientific officers than those at present serving Her Majesty could be found in any naval service, or at any other period. My contention is merely that from their training and experience the generality of Royal Navy officers are not so competent to give an opinion on the general handling of a merchant vessel as the better class of merchant officers who have all these details at their finger ends.

I conclude this already too lengthy letter by commending it to the attention of the masters and officers of the British Mercantile Marine, and should it, in the slightest degree, be

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instrumental in improving their condition or lessening their grievances the writer will not have written in vain.

A. E. B.

LASCARS AS SEAMEN.

To the Editor of the "Nautical Magazine."

SIR,—I observe that the Seamen and Firemen's Union have issued a "manifesto" regarding the employment of Lascars. This is a matter which now and again crops up, is talked about for a week or so, and is then forgotten "till the next time." The question for us seems to be this: "Is it a matter of vital importance in which shipmasters and officers should let *their* voice be heard?" Would it, for instance, be worth while to insert any clause regarding this question in the Bill to be brought forward in Parliament by the Shipmasters'. and Officers' Federation.

Now, though the evidence of landsmen in cases like the loss of the *Roumania* is always open to suspicion, by reason of their lack of nautical knowledge and their state of terror at the time, still cases like this *must* force the question before the public and may bring forth some piece of doubtful and unfair legislation. It would seem, therefore, as if the seaman in command ought to let his voice be heard in the matter. It would have been a good thing if more had been made of the *El Dorado* case years ago, where the ship was only brought back by officers assisted by passengers, the *callasic* crew being absolutely paralysed by "funk."

Now all of us who have had experience of these Lascar crews know perfectly well the stuff they are made of, and it is useless to deny their worthlessness in a real case of danger. Many of us may remember Calcutta pilots saying that when their brigs have been caught in a cyclone it has fallen to themselves and the leadsmen to handle the vessel, the natives being useless. During a cyclone in Calcutta I have myself helped to rescue dozens of men from the native boats which, being driven across the moorings, were dashed to pieces under the ship's stern, their crew crouching down in the boat's bottom speechless and helpless, so much so that men had to be lowered down from the stern cabin windows to put a bowline round them, that they might be hauled up into safety.

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Is there, then, any justice in what the Seamen's Union have published on the point? Let us examine what they have said.

As usual, with that badly organised Society, they have at once gone too far, and started with "blackguarding" large steamship firms; it would seem as though their *great* object in every instance was to "stir up strife." What more senseless course could have been taken than charging a Company like the P. & O. with sacrificing safety to cheapness! Wild, irresponsible statements like these overshoot the mark, and immediately put all thoughtful men against the Union which has published them. The other silly remark about "no reduction in the passenger rate" is also all nonsense. Then, again, they say, "Had these steamers," referring to the late serious losses, "been manned by *British seamen*," &c. They forget that these men are their own fellow subjects, and, whatever their faults, live under our flag and laws just as much as Canadians or any other over-sea subjects of the British Empire.

The one and only point worth our consideration in the statement issued is, when divested of all the "clap-trap" of the rest of the matter, "are steamers manned by these Eastern races safe and proper vessels for *passengers* to travel in?"

Passenger steamers are "passed" by Board of Trade surveyors, and are, presumably, fit for the service intended; but we think that, if everything regarding the safety of the ship was left in the hands of those gentlemen, it would be a very bad thing for passengers. It is to the company which own the vessels that many things *must* be left. "Lloyd's" and the Board of Trade certificates may—and do—ensure as far as practicable the fitness of hull, machinery, equipments, and so on. The Board of Trade certificates also provide that efficient men are on board to navigate and manage the vessel's engines. Can they judiciously go farther? We think not. Who then is the man to whom the proper manning of the vessel should be left? That is the question.

Let us first take the engine-room. It may be taken for granted that, under an efficient staff of engineers, a set of Bombay "sedy boys" are preferable to Europeans in an Eastern going steamer. They might perhaps fail in a last extremity, but so might Britishers. Firemen are not usually of the same "pluck" as the seamen. The writer was once in a grain steamer on beam ends in mid-Atlantic, water got into

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the stoke-hole and washed the fires out, the firemen, Irish Catholics, at once took to their prayers and had to be *beaten* to work. And now about the seamen proper.

Take a 4,000-ton steamer with, let us say, fifty passengers. Man her with the same number of Lascars. Now, suppose her ashore on a dirty night *in winter*. Are these "shivering" beings fit to make an attempt to launch the boats? Was it Michael Scott who gave us the picture of the negro soldier?

"Him too cold for brave to-day!"

Moments like these try the very best of Anglo-Saxons, and let it be at once admitted that we all *know* that in cases like this the Lascar fails *utterly*. I could cite a case where "Dutchmen" have failed in a similar manner; and it is my opinion, based on actual experience, that when a last extremity arrives it is only the Anglo-Saxon—either British or American—who can so control himself as to show a bold front, and have a last fight for life.

What then should be done? This. *All* officers should be white men; not alone commander, deck officers, and engineers, but boatswains and their mates, quartermasters, donkeymen, and such like. There would then be a sufficient number to man boats in an emergency and give helpless passengers a chance of their lives, if chance there was. Let us see what sort of muster we could make, and let us put aside at once the idea that Englishmen are not suitable for Eastern trades. Many of us can remember when the *Feroze* was entirely *manned* by a white crew.

Well, then, a 4,000-ton passenger steamer:—

Commander, doctor, and officers	...	6 at least.
Engineers and boiler-maker ...	...	6 ,,
Boatswains, mates, and quartermasters		6 ,,
Donkeymen and greasers ...	...	4 ,,
Carpenter and lamp-trimmer ...	...	2 ,,

Supposing we stop here; we have, omitting the commander, 23—amply sufficient to handle two large life-boats. We are strongly of opinion that no large passenger steamer should be allowed to clear without this number of Europeans on board. There would be other white men, cooks, stewards, and so on, but they have not been enumerated as classing with "non-combatants." I commend the matter to the consideration of your readers.

MASTER MARINER.

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BOOKS RECEIVED.

Navigation of the Atlantic Ocean. Winds, Weather, and Currents. By the late A. B. Becher, Captain R.N. Fifth Edition. London: J. D. Potter, 31, Poultry, E.C. 1892.

"GOOD wine needs no bush," and this valuable work by the former Editor of the *Nautical Magazine*, has advertised itself by its own merits. A new edition is now demanded, and the publishers have therefore caused additions to be made to the volume to bring its information up to the present date. The new particulars are gathered from the voyages of recent navigators, the Admiralty wind and current charts, and the records of the Meteorological Office. The handy charts bound up with the book afford valuable information for those who traverse the North and South Atlantic. We think the publishers have done wisely in issuing this new edition, and doubtless they will be well repaid by the circulation which so useful a work is likely to have.

Concise Navigating Directions for the River Thames. By Stephen Penney, Trinity Pilot, Gravesend. London: J. D. Potter, 31, Poultry, E.C. 1892.

MR. STEPHEN PENNY has made a new departure. He is a licensed Trinity House pilot, dependent for his living on the practice of his profession in the waters of approach to the Port of London. An accurate acquaintance with all details respecting the various channels he refers to is essential for him, and might possibly be regarded as the exclusive knowledge upon which a pilot justifies his *raison d'être*. This knowledge Mr. Penney now imparts to all who will consult his book, and it is the publication of this special information, supposed by many to be held as a sort of trade secret among the whole body of pilots, which strikes us as a new departure and comes upon us as a surprise. But we do not desire it to be thought that we think ill of Mr. Penney's action, on the contrary, we are glad to welcome this publication; we see in it an indication of freedom of spirit on the part of an intelligent pilot, quite opposed to the ancient spirit of monopoly and protected interests which have too long dominated this particular industry.

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The merits of the work are considerable. The area dealt with extends from London Bridge to Orfordness on the north, and to the South Foreland on the south, with twenty-four neatly executed charts of different sections of the navigation. Various tables and information of value to maritime men are also included, and add to the utility of the work.

There can be no doubt that Mr. Penney's handy volume will be of great service to many masters of small steamers and coasters, but especially will it assist the yachtsman. Captain J. C. Almond, of the P. & O. S. N. Co., has assisted Mr. Penney in the arrangement of his work, and has personally supervised the whole of it; this affords a satisfactory assurance, even if Mr. Penney's reputation were not sufficient, that the information given is accurate.

We hope Mr. Penney's first attempt will be a success so as to encourage him to publish further useful works.

The American Practical Navigator. Nathaniel Bowditch, LL.D. Revised by order of the Bureau of Navigation, Navy Department. Washington: Government Printing Office. 1892.

BOWDITCH'S well-known work on Navigation and Nautical Astronomy having become the property of the United States Government was thoroughly revised and brought up to date by Commander P. H. Cooper, U.S.N., under the direction of the Bureau of Navigation. The revised edition of 1892, just to hand, contains all that the practical navigator need know. It is a most comprehensive work, and the price, $2.25, puts it within the reach of ill-paid seafarers. Log, lead, compass, mathematical instruments, charts, log-books, the sailings, and methods of taking a departure, are clearly explained. In Nautical Astronomy, latitude, longitude, azimuth, and amplitude methods are neatly indicated. The chapter on Sumner's method will especially commend itself for conciseness and accuracy of explanation. Most interesting chapters on winds, storms, tides, currents, and nautical surveying, are followed by every necessary table and an appendix with examples of arithmetic, geometry, trigonometry, and useful problems. This work is very suitable for navigators, whether mathematically inclined or otherwise, and worthy of the highest praise.

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The Art and Science of Sailmaking. By Samuel B. Sadler, Practical Sailmaker. London: Crosby, Lockwood & Son. 1892.

Electric Ship Lighting. By J. W. Urquhart. Crosby, Lockwood & Co.

La Nao Santa Maria. Memoria de la Comision Arqueologica Ejecutiva, 1892. Dibujos de R. Mouleon.

WE hope to review at length in our next number all of these important works.

OFFICIAL RETURN OF BRITISH WRECKS IN OCTOBER, 1892.—The number and tonnage of British vessels respecting whose loss reports were received at the Board of Trade during the month of October, 1892, and the number of lives lost, are as follows:—

Description.	Number.	Tonnage.	Lives Lost.
Sailing	46	 11,715	 86
Steam	7	 3,923	..... Nil.
Total	53	 15,638	 86

The above table is a record of "reports received" in the month, and not of wrecks which occurred during the month. Many of the reports received in October relate to casualties which occurred in previous months. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.—GEORGE J. SWANSTON, Assistant-Secretary, Marine Department, Board of Trade, November 1st 1892.

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THE ROYAL NAVAL RESERVE.

THE *SATURDAY REVIEW* ON THE *TIMES* AND ITS "DISCREDITABLE PROJECT."

THE waspish letter which appeared in the *Times* of Monday, under the heading of "A Discreditable Project," will be found, in the long run, to be of material service to the persons whom it is designed to rebuke. It has, indeed, already served to give extended publicity to the fact that Naval officers in general are suffering from grievances which even the most hostile critics of the "Discreditable Project" allow to be severe and to call for remedy. This is in itself a distinct gain for the authors of the "project" in question. Much harm may, indeed, be done if the Admiralty and Parliament allow themselves to be animated by the spirit of the author of the letter and, we may add, the writer of some further comments on the subject in the *Times* of Wednesday. At the risk of giving an advantage to stupidity and ill-will, we note that the writer, or writers, in the *Times* have taken exactly the tone used by the authorities towards the very legitimate complaints of the sailors in 1797. The grievances, we are told, are real, and each man may legitimately complain of them for himself. As long as he does no more than this, his conduct is correct. The critics do not add that it is also most convenient to authorities who do not propose to bestir themselves to supply a remedy, since individual complaints can be safely neglected. When, however, men complain together, this is "illegal and insubordinate." The "sympathy and generosity" of the country will be "frightened." It will be shocked at discovering that the complainants are not, as was supposed, "the incarnation of discipline, legality, and patriotism"; so, it is implied, if not expressly stated, the acknowledged grievances shall not be remedied. Now this is in every detail the language of the official people who rejected the absolutely just complaints of the sailors in 1797 as the work of ill-disposed persons, and threw their petitions to the House of Commons into the waste-paper basket, with results which make a lamentable passage in the Naval history of this country. It is thoroughly contemptible, pedantic, and dishonest. Moreover, it is habitually found in the mouths of persons who, when

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discontent refuses to be kept quiet by paper regulations and technicalities, are found ready to give to fear what they would not give to justice, and that with grovelling haste.

Of course, only the stupidity and ill-will to which we have referred will suppose for a moment that we are drawing any comparison between the events of 1797 and the "Discreditable Project." The comparison is between the language of certain directly and indirectly official persons then and now. As regards the project, agitation, or whatever else it is to be called, it is a very simple matter. For some years past Naval officers have complained of certain grievances common to them all. It is not denied that these grievances exist, and ought in fairness to be remedied. Yet they have not been touched. In the meantime attention has been paid to the complaints of some classes of officers who have combined to make themselves heard. The citizen and officer (by the way, we should have thought such a martinet as this "officer" would have called himself subject, and not by a name which either conveys the unimportant information that he is member of a City Company or is a cant Americanism)—this citizen and officer indulges, towards the end of his letter, in the ill-bred practice of talking at some unspecified body of officers whose "organised agitation" has extorted "advantages which neither their utility as a class nor the individual merits of the majority of them deserved." Now, without wasting time over the justice or manners of this attack on the officers unnamed, we may simply draw the moral from the recorded facts. On the showing of this critic of the "Discreditable Project" the Admiralty have yielded to the organised agitation of some officers, while it has persistently neglected the grievances of those who have not agitated. Be it observed, too, that nothing was heard of any offence against the Queen's Regulations and the Naval Discipline Act, on the part of those who did gain their point. This being so, we are not in the least surprised to hear that many officers have come to the conclusion that combination, for the purpose of stating their grievances, is not an offence against the Articles of War, and if they want to obtain redress, they would do well to combine. That a technical breach of the regulations has been committed is possible. If so, the officers will doubtless regret it, and amend what is wrong. We do think that Captain Robinson has at least gone near to showing too much journalistic enterprise in this matter; but that is a very small thing,

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which does not in any way affect the justice of the demands of the officers, nor the question whether they are likely to get attention paid to them without some common action. What breach of the regulations there may be is certainly only technical. It is mere scolding to talk of "want of patriotism," or of "illegal and insubordinate means."

* * * * *

Of course, the Admiralty may take the dry official line. It may reply that officers knew the terms on which they engaged —which is, of course, formally true, though only formally in the case of the boys who enter the *Britannia*. It may, if it likes, adopt the tone of the strictest sect of the Pharisees, and the letter will bear it out. But it must be clearly understood that this will be done at the expense of confirming the discontent of the officers and spreading the belief that the Naval service is not one in which fair treatment is to be expected. Whether it is worth while to incur this risk for the sake of maintaining official orthodoxy is a question which, in our opinion, only requires to be stated.

THE GAZETTES.

Admiralty, October 29th.

Engineer A. Henderson to be Senior Engineer (to date October 27th, 1892).

Admiralty, November 2nd.

Sub-Lieutenant J. W. Hague to be Lieutenant (to date November 1st, 1892).

Admiralty, November 5th.

C. B. Morfee to be Sub-Lieutenant (to date November 3rd, 1892).

Admiralty, November 8th.

Sub-Lieutenant L. A. Errington to be Lieutenant (to date November 7th, 1892).

APPOINTMENTS.

Lieutenants: C. A. Hugill to *Excellent* (additional) for short gunnery and torpedo courses (to date October 22nd); F. H. Ekins to *Nelson* (to date November 4th); A. G. Hamilton (acting) to *Camperdown* (to date November 9th); H. A. Blake to *Severn* (additional), and for reappointment when recommissioned (to date November 10th); H. N. Dewhurst (acting) to *Mercury* on recommissioning; P. Cullen (acting) to *Rodney* (to date December 7th). Sub-Lieutenants: P. N. Layton

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(acting) to *Camperdown* (additional) for twelve months' training (to date October 15th); C. E. Oswald to *Excellent* (additional) for short course of gunnery and torpedo (to date October 22nd).

At a recent meeting of the Bootle Branch of the National Independent Seamen's and Firemen's Association the loss of the *Roumania* was discussed, and the members present were unanimously of opinion that passenger vessels should be manned by seamen of the Royal Naval Reserve.

It is stated that Commanders of the Royal Indian Marine holding the appointments of Deputy Director and Assistant Director of the Royal Indian Marine will be officially designated as "captains," but all others will in future be officially designated as "commanders."

A correspondent of a service contemporary seeks for information as to the exact date of the following occurrence supposed to have taken place in the year 1856.

"The barque *Trent*, of and from London, Ceylon, &c., was being warped to the quay at Launceston, Tasmania, when a boat fouled her hawser, and the occupant of the boat was drowned."

Perhaps some of our readers may know something about the *Trent* and the occurrence in question.

At the recent dinner of the members of the Royal Navy Club, of 1765 and 1785, to commemorate the battles of Trafalgar, Camperdown, and Navarino, that grand old merchant seaman, Sir Sydney Webb, Deputy Master of the Trinity House, was the guest of the evening. *Apropos*, it is amusing to note how persistently the service papers claim Sir Sydney for the R.N.

It was originally intended to make Gibraltar the headquarters of the Channel Squadron during the winter cruise, and the vessels were not expected to arrive home until May next. The loss of the *Howe* has, however, altered the programme, and it now seems certain that the Squadron will spend Christmas in home waters, after all, the holding of the Court-Martial on the loss of the *Howe* necessitating its immediate return.

By the time this number will be in the hands of our readers, Nelson's old flagship, the *Foudroyant*, will probably have

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arrived in the Thames, as arrangements are now being completed for her towage across from Swinemünde. She has been purchased by a few private gentlemen, and it is intended to have her fitted up for public inspection, and after her cost and all expenses have been defrayed, to present her to the nation for use as a naval museum.

THE *Army and Navy Gazette* congratulates our Australian cousins on the fact that they are awake to the importance of drilling their Naval Brigade with modern guns, while we at home have several R.N.R. drill batteries where the guns are quite obsolete. We have on several occasions commented on the utter folly and waste of time and energy in exercising men with these antiquated weapons, in use since the days of Nelson, but we suppose nothing will be done until some Member of Parliament is patriotic enough to raise the question and have it settled in the House.

IN our note on the loss of the P. and O. liner *Bokhara*, in our November issue, we omitted, by an oversight, reference to the sad loss of Sub-Lieutenant George Francis Stanser Ingles, second officer of that ill-fated vessel. He was the second surviving son of Major Ingles, late 32nd and 16th regiments, and grandson of the late venerable Archdeacon Best. Mr. Ingles, who was only in his 30th year, received his Sub-Lieutenant's Commission in 1890. His relatives will be glad if Australian and Canadian papers will notice his death.

OUR readers will be pleased to learn that Lieutenant R. P. Parkman, R.N.R., who has recently completed a period of service in the Fleet, and is now going through a gunnery course in the *Excellent*, has been the recipient of a handsome silver cigar case—"From his messmates, H.M.S. *Hecla*, 1891 and 1892." These tokens of the good feeling and comradeship existing between the officers of the Royal Navy and the Reserve will, we are sure, be extremely gratifying to everyone having the welfare of the Naval Service of the country at heart.

THE *Army and Navy Gazette*, referring to the latest literary production of Lieut. F. J. Davis, noticed in our last issue, says :—

"A nautical novel by a nautical man is now in the press, and will be ready shortly. The book is entitled *Over the Sea*, and the author is

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Lieut. F. J. Davis, R.N.R., late chief officer Peninsular and Oriental Steam Navigation Company, and since Lieutenant R.N.R. in the *Amphion* and *Dreadnought*. Mr. Davis is the author of *Sailors' Songs or Chanties*, and was the winner of a twenty guinea prize, offered by one of our contemporaries for the best yarn by a sailor. A tale of the sea by a sailor should be of interest, and no doubt many of Mr. Davis's brother officers will look forward to the advent of this novel with pleasure."

THE nautical experts—Captain J. G. Dathan, R.N., Lieut. P. S. Tomlin, R.N.R., late commander P. and O. Service, and Lieut. J. H. F. Dixon, R.N.R., late commander Orient Line—appointed by the Docks Committee of the Bristol Corporation Council to investigate various nautical questions connected with the Bristol Docks extension scheme, have recently handed in their report, the gist of which is as follows:—

"The geographical position of the port of Bristol is so widely known that comment seems unnecessary, but perhaps we may be permitted to once more call attention to some of the main points of advantage which it enjoys over any port in the United Kingdom:—1. Its position in regard to vessels coming from America. 2. Its ready access at all times of tide; at any rate, so far up as to reach a safe and convenient anchorage for the largest ship. 3. The generally accepted theory of absence of fogs. 4. By using the Bristol Channel the dangers and delay in the navigation of the Irish and English Channels are avoided."

THE Customs authorities were recently guilty of a bit of rather sharp practice in prosecuting Captain Robert Wilson Stirling, of the steamer *Cameo*, of Alloa, for failing to deliver a transire upon landing goods at Stornoway. The goods in question were Ordnance stores for the Royal Naval Reserve Battery at that port, and as Captain Stirling had been employed in the conveyance of War Office stores for the past fifteen years without any transire being demanded on any previous occasion, the Stornoway "Bailies" took the common sense view of the case, that no fraud or detriment to Her Majesty's Customs had been committed, and dismissed it. This was not enough for the Customs authorities, who carried the case to the Edinburgh Justiciary Appeal Court, but having gone thus far they funked it, and contented themselves with entering a protest that their decision not to prosecute the appeal was not to be drawn into a precedent in any way affecting the position or liabilities of private vessels carrying Government stores. The Court accordingly dismissed the appeal, and of course found the appellants liable in expenses.

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WE hope our Reserve subscribers who are anxious to obtain employment ashore are alive to the opportunities about to be offered in that direction by the establishment of the Chamber of Arbitration under the joint auspices of the London Chamber of Commerce and the City Corporation. We understand that every year the Corporation and the Chamber of Commerce are to select a number of approved arbitrators, whose technical knowledge will be placed at the disposal of litigants in the settlement of trade disputes, maritime casualties, and, in fact, every other class of case that has hitherto been carried into the Law Courts. According to the *Shipping Gazette*, the arbitrators "are to be British subjects, who have been in business in the Metropolis for at least seven years as bankers, brokers, merchants, or otherwise," and shipmasters "who have served as such on sea-going vessels for at least seven years, and other persons considered specially qualified are also available for inclusion in the list." As it is stated that the arbitrators for ordinary cases are to have a fee of two guineas for the first hour and one guinea an hour afterwards, and the fees in extraordinary cases are "to be left open" (which sounds nice), we imagine the competition for these appointments in nautical circles at any rate will be pretty keen.

AN army officer, writing to a service contemporary on the subject of rewards for long service, makes the following observations:—

"The remuneration paid by a "Generous Country" to officers in either service can hardly be considered as an equivalent remuneration for the best years of a man's life, and as there is no other reward for officers who are not fortunate enough to see active service, I venture to ask permission through your columns to suggest a form of reward for long service to officers, either in the Army, Navy, or Reserve Forces, which, if adopted, would be conducive to a closer connection between the commissioned ranks of the Army, Navy, and Volunteers by inducing officers who retire at an early age from the regular forces to take commissions in the Volunteers for the purpose of completing the term of service necessary to entitle them to the reward in question."

His proposal is, in brief, the creation of a new order of Knighthood, to be called "The Order of the Army and Navy," and to be composed of Grand Commanders, Knights Commanders, and Commanders. Service in any branch of the Army, Navy, or Reserve Forces to qualify for the Order, which he proposes should be retrospective. The idea is worth

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consideration, but, in the meantime, from a Naval Reserve standpoint, we are curious to see what action the authorities will take in the matter of extending the existing Volunteer officers' decoration to the officers of the Army Reserve—we mean, of course, the Militia, the majority of whom are anxious to get it.

We need make no apology for reproducing at this comparatively late date some portions of the really excellent article which appeared in the *Saturday Review* on the subject of naval officers' grievances. Many of our Reserve subscribers may not have had an opportunity of seeing the *Saturday Review*, and as the main points of the article in question—every line of which is remarkable for its sound common sense—have a distinct bearing on the present unfortunate position which Reserve officers now find themselves in through no fault of their own, but entirely owing to the misguided and ill-judged action of the late Board of Admiralty, we think that its contents should be carefully noted. With regard to the printing of the pamphlet on the Indian Marine Precedency question, it will be remembered that we purpose setting forth the two Orders in Council in parallel columns, also to reprint a selection of the notes and correspondence that have appeared in the pages of this journal on the question. The permission to reproduce the letters of those officers who preferred not to use pseudonyms will, of course, be previously obtained from the writers. We hope to have the pamphlet ready for distribution amongst members of both Houses of Parliament before the opening of the Session, but meanwhile we shall be glad to receive any suggestions from our Reserve friends that will tend to make the pamphlet what we should like it to be—a plain and fair statement of the grievance complained of, on perusal of which any person of ordinary intelligence might be able to take part in a debate on the subject.

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STATIONS OF HER MAJESTY'S SHIPS ON WHICH R.N.R. OFFICERS ARE SERVING OR ARE ABOUT TO SERVE.

CORRECTED UP TO NOVEMBER 5TH.

Name.	Guns.	Men.	Class.	Commanding Officer.	When and where Commissioned.	Station.
Amphion ...	10	296	D.S. Cruiser, 2nd class	Capt. J. R. E. Pattison ...	Dec. 11, 1888, Devonport	Mediterranean.
Anson	10	580	D.S. Bat.-ship, 1st cl.	Capt. G. Boyes	May 28, 1889, Portsmouth	Channel Squadron.
Australia ...	12	461	D.S. Cruiser, 1st class	Capt. S. C. Holland	Nov. 19, 1889, Chatham ...	Mediterranean.
Boadicea ...	14	426	S. Cruiser, 2nd class	Capt. C. S. Donner ... ... (R.-Ad. F. C. B. Robinson.)	Re-c. June 24, Malta ...	East Indies.
Camperdown ...	10	380	D.S. Bat.-ship, 1st cl.	Capt. C. Johnstone	July 21, 1892, Portsmouth	Mediterranean.
Canada ...	10	266	S. Cruiser, 3rd class	Capt. H. W. Dowding ...	Re-c. Nov. 12, 1889, Bermuda	N. America and W. Indies.
Cleopatra ...	12	283	S. Cruiser, 3rd class	Capt. Hon. Curzon-Howe ...	Sept. 21, 1892, Devonport	N. America and W. Indies.
Collingwood ...	10	420	D.S. Bat.-ship, 1st cl.	Capt. C. C. P. Fitzgerald ...	Nov. 7, 1889, Portsmouth	Mediterranean.
Colossus ...	9	325	D.S. Bat.-ship, 1st. cl.	Capt. T. S. Jackson	... ... Malta ...	Mediterranean.
Conqueror ...	6	...	D.S. Bat.-ship, 3rd cl.	Staff C. F. Rowlatt	... ...	Devonport.
Dreadnought ...	4	440	D.S. Bat.-ship, 1st cl.	Capt. A. W. Moore	Re-c. Dec. 17, 1890, Malta	Mediterranean.
Edinburgh ...	9	450	D.S. Bat.-ship, 1st cl.	Capt. Brackenbury, C.B. ...	Re.-c. Oct. 7, 1890, Malta	Mediterranean.
Hecla	6	272	Torpedo Depôt-ship	Capt. Durnford, D.S.O. ...	Nov. 6, 1888, Portsmouth	Mediterranean.
Howe	10	523	D.S. Bat.-ship, 1st cl.	Capt. Hastings, C.B. ...	May 9, 1890, Portsmouth	Channel Squadron.
Immortalité ...	12	467	D.S. Cruiser, 1st class	Capt. Sir Wm. Wiseman, Bart.	July 1, 1890, Chatham ...	Channel Squadron.
Inflexible ...	12	463	D.S. Bat.-ship, 1st cl.	Capt. F. S. Vander-Meulen ...	July 1, 1890, Portsmouth	Mediterranean.
Leander ...	10	280	D.S. Cruiser, 2nd class	Capt. B. Watson	Re-c. Ap. 5,'89, Hong Kong	China.
Mercury ...	13	280	D.S. Cruiser, 2nd class	Capt. C. J. Balfour	Feb. 18, 1890, Portsmouth	China.
Narcissus ...	12	467	D.S. Cruiser, 1st class	Capt. J. H. Bainbridge ...	May 4, 1892, Devonport	Channel Squadron.
Nelson	16	322	D.S. Cruiser, 1st class	Capt. Woodward, C.B. ...	Oct. 1, 1891, Portsmouth	Portsmouth.
Nile	10	548	D.S. Bat.-ship, 1st cl.	Capt. G. H. U. Noel	June 30, 1891, Portsmouth	Mediterranean.
Phaeton ...	10	285	D.S. Cruiser, 2nd class	Capt. R. N. Custance ...	Re-c. Mar. 18, 1890, Malta	Mediterranean.
Pylades ...	14	161	S. Cruiser, 3rd class	Comm. J. B. Young	Re-c. Nov. 13, '89, Bermuda	N. America and W. Indies.
Rodney ...	10	515	D.S. Bat.-ship, 1st cl.	Capt. Henry Rose	May 14, 1890, Chatham ...	Channel Squadron.
Royal Sovereign	14	713	D.S. Bat.-ship, 1st cl.	Capt. Tynte F. Hammill, C.B.	May 31, 1892, Portsmouth	Channel Squadron.
Sans Pareil ...	15	583	D.S. Bat.-ship, 1st cl.	Capt. Wilson, V.C., C.B. ...	Feb. 9, 1892, Chatham ...	Mediterranean.
Severn	12	243	D.S. Cruiser, 2nd class	Capt. R. F. H. Henderson ...	Feb. 19, 1889, Portsmouth	China.
Tourmaline ...	12	250	S. Cruiser, 3rd class	Capt. J. H. Rainier	Re-c. Nov., 1889, Bermuda	N. America and W. Indies.
Trafalgar ...	10	550	D.S. Bat.-ship, 1st cl.	Capt. G. C. Robinson ... (R.-Ad. A. H. Markham.)	April 2, 1890, Portsmouth	Mediterranean.
Undaunted ...	12	461	D.S. Cruiser, 1st class	Capt. Lord C. Beresford, C.B.	Feb. 18, 1890, Devonport	Mediterranean.
Victoria ...	15	587	D.S. Bat.-ship, 1st cl.	Capt. Hon. M. A. Bourke ... (V.-Ad. Sir G. Tryon, K.C.B.)	Re-c. Ap. 29, 1890, Malta	Mediterranean.

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TIDE TABLES FOR DECEMBER, 1892.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS.		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
Th	1	11 12	11 40	3 26	3 58	0 30	0 55	11 48	—	2 35	3 4	8 4	8 32	3 33	4 5	8 26	8 51	9 2	9 30	1 52	2 21	8 15	8 43	5 12	5 34	0 48	1 15
F	2	—	0 6	4 19	4 43	1 19	1 42	0 12	0 36	3 30	3 56	8 58	9 23	4 35	5 3	9 16	9 39	9 58	10 21	2 49	3 15	9 9	9 33	5 56	6 19	1 41	2 5
S	3	0 31	0 54	5 7	5 31	2 4	2 27	0 59	1 23	4 22	4 47	9 49	10 16	5 31	5 58	10 8	10 27	10 46	11 12	3 41	4 7	9 56	10 18	6 44	7 9	2 29	2 53
S	4	1 19	1 44	5 55	6 20	2 50	3 14	1 47	2 11	5 12	5 37	10 43	11 10	6 25	6 51	10 52	11 18	11 38	—	4 33	4 59	10 41	11 5	7 34	7 58	3 17	3 42
M	5	2 8	2 33	6 45	7 10	3 38	4 3	2 35	2 59	6 2	6 27	11 37	—	7 17	7 42	11 48	—	0 4	0 30	5 24	5 49	11 30	11 56	8 21	8 44	4 7	4 32
Tu	6	2 57	3 22	7 35	8 0	4 28	4 53	3 23	3 48	6 50	7 13	0 4	0 31	8 6	8 29	0 8	0 33	0 56	1 22	6 14	6 39	—	0 22	9 7	9 30	4 57	5 21
W	7	3 47	4 11	8 25	8 50	5 18	5 43	4 18	4 38	7 36	7 58	0 58	1 24	8 52	9 14	0 57	1 21	1 47	2 11	7 4	7 28	0 48	1 14	9 58	10 18	5 46	6 9
Th	8	4 36	5 0	9 15	9 40	6 9	6 35	5 4	5 31	8 19	8 40	1 50	2 15	9 35	9 56	1 45	2 9	2 35	2 58	7 51	8 14	1 40	2 6	10 44	11 12	6 33	6 58
F	9	5 24	5 49	10 5	10 32	7 2	7 30	5 58	6 26	9 2	9 26	2 40	3 5	10 16	10 37	2 33	2 58	3 22	3 47	8 38	9 2	2 32	2 58	11 45	—	7 24	7 50
S	10	6 15	6 43	11 1	11 38	7 59	8 30	6 55	7 26	9 51	10 19	3 30	3 55	11 0	11 26	3 24	3 52	4 12	4 38	9 26	9 51	3 26	3 56	0 21	0 59	8 17	8 45
S	11	7 11	7 39	—	0 7	9 3	9 37	7 58	8 31	10 48	11 18	4 20	4 46	11 55	—	4 22	4 54	5 6	5 35	10 19	10 50	4 27	4 58	1 37	2 14	9 15	9 47
M	12	8 9	8 40	0 39	1 9	10 10	10 42	9 4	9 37	11 50	—	5 13	5 41	0 25	0 56	5 28	6 3	6 5	6 37	11 22	11 53	5 29	5 59	2 48	3 19	10 20	10 53
Tu	13	9 14	9 48	1 39	2 8	11 18	11 42	10 7	10 35	0 23	0 56	6 10	6 40	1 26	2 0	6 37	7 8	7 8	7 38	—	0 24	6 38	6 56	3 46	4 11	11 25	11 56
W	14	10 19	10 50	2 36	3 3	—	0 9	11 2	11 29	1 28	1 58	7 10	7 40	2 31	3 2	7 37	8 5	8 8	8 37	0 55	1 26	7 23	7 50	4 35	4 57	—	0 25
Th	15	11 19	11 44	3 30	3 56	0 35	1 0	11 54	—	2 27	2 54	8 8	8 33	3 33	4 2	8 31	8 54	9 5	9 30	1 55	2 21	8 17	8 42	5 18	5 37	0 53	1 18
F	16	—	0 7	4 20	4 42	1 22	1 41	0 16	0 36	3 19	3 42	8 55	9 16	4 28	4 53	9 15	9 35	9 52	10 13	2 44	3 6	9 5	9 27	5 55	6 14	1 39	1 59
S	17	0 30	0 51	5 1	5 20	2 0	2 18	0 55	1 14	4 8	4 24	9 37	9 58	5 17	5 39	9 54	10 13	10 34	10 55	3 28	3 49	9 48	10 7	6 34	6 54	2 19	2 38
S	18	1 11	1 31	5 39	5 58	2 36	2 54	1 33	1 52	4 45	5 5	10 18	10 38	6 0	6 21	10 33	10 50	11 16	11 36	4 9	4 29	10 24	10 41	7 13	7 32	2 57	3 16
M	19	1 49	2 7	6 17	6 36	3 12	3 30	2 11	2 29	5 24	5 42	10 58	11 18	6 41	7 1	11 8	11 26	11 56	—	4 48	5 7	10 58	11 15	7 50	8 7	3 34	3 52
Tu	20	2 25	2 42	6 55	7 13	3 48	4 6	2 46	3 2	6 0	6 18	11 38	11 59	7 20	7 39	11 44	—	0 15	0 34	5 26	5 45	11 33	11 52	8 24	8 41	4 10	4 28
W	21	3 0	3 19	7 32	7 52	4 24	4 43	3 19	3 38	6 36	6 54	—	0 20	7 58	8 16	0 3	0 23	0 58	1 12	6 4	6 24	—	0 12	8 59	9 17	4 47	5 6
Th	22	3 37	3 56	8 12	8 32	5 3	5 23	3 58	4 18	7 12	7 30	0 41	1 2	8 34	8 52	0 42	1 2	1 31	1 50	6 44	7 4	0 32	0 52	9 35	9 58	5 25	5 44
F	23	4 15	4 34	8 52	9 12	5 43	6 5	4 38	4 59	7 48	8 7	1 23	1 45	9 11	9 30	1 22	1 42	2 10	2 31	7 24	7 44	1 13	1 34	10 13	10 35	6 4	6 25
S	24	4 58	5 18	9 32	9 53	6 27	6 49	5 21	5 45	8 27	8 48	2 7	2 29	9 49	10 8	2 2	2 23	2 52	3 13	8 4	8 25	1 56	2 19	10 58	11 25	6 47	7 10
S	25	5 36	6 0	10 16	10 40	7 13	7 39	6 10	6 35	9 11	9 35	2 51	3 18	10 27	10 47	2 45	3 7	3 34	3 56	8 46	9 9	2 48	3 7	11 55	—	7 34	7 58
M	26	6 24	6 50	11 8	11 39	8 7	8 36	7 2	7 31	10 0	10 27	3 36	4 0	11 9	11 33	3 31	3 57	4 20	4 46	9 33	9 58	3 33	4 1	0 37	1 3	8 24	8 52
Tu	27	7 17	7 45	—	0 11	9 3	9 41	8 2	8 34	10 57	11 28	4 25	4 51	—	noon	4 26	4 57	5 13	5 41	10 25	10 55	4 32	5 3	1 40	2 17	9 20	9 51
W	28	8 15	8 46	0 43	1 14	10 14	10 47	9 7	9 41	—	0 2	5 18	5 46	0 30	1 2	5 31	6 7	6 11	6 43	11 27	—	5 34	6 5	2 52	3 23	10 25	11 1
Th	29	9 20	9 54	1 45	2 16	11 20	11 53	10 14	10 46	0 39	1 16	6 17	6 51	1 36	2 11	6 44	7 20	7 16	7 50	0 1	0 36	6 36	7 7	3 53	4 21	11 37	—
F	30	10 28	11 2	2 47	3 18	—	0 24	11 17	11 47	1 51	2 25	7 26	8 0	2 47	3 25	7 53	8 24	8 25	8 59	1 11	1 47	7 38	8 10	4 47	5 12	0 18	0 46
S	31	11 36	—	3 49	4 20	0 54	1 22	—	0 16	2 58	3 30	8 33	9 4	4 3	4 39	8 54	9 23	9 31	10 1	2 22	2 54	8 43	9 15	5 37	6 3	1 17	1 47

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 8	Brest
Boulogne	+0 13	Dover
Bridport	+0 2¼	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbeliton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 33	Devonport
Falmouth	−0 46	Devonport
Fecamp	+ 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 33	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 33	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 53	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 33	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

Note.—The following abbreviations will occasionally be used in the Abstract, as required:—

Arch. = Archipelago; Chan. = Channel; Cst. = Coast; Harb. = Harbour; Is. = Island; Lt. = Light; Lt.-ho. = Lighthouse; Lt.-ves. = Light-vessel; Pt. = Point.

E. = East; N. = North; S. = South; W. = West.

Lights are—F. = Fixed or steady; Fl. = Flashing; F. and Fl. = Fixed, with a flash in addition; Rev. = Revolving; Int. = Intermittent; Alt. = Alternating; Occ. = Occulting; Elec. = Electric.

Illuminating apparatus (Ill. app.) is catoptric (by metallic reflectors); or dioptric (by refracting lenses).

Positions may be—Approx. = Approximate; or P. D. = Position doubtful.

No.	Place.	Subject.
516	England—Needles Chan.—Hurst Pt.	Lights to be altered in May, 1893.
517	„ Thames Entrance—Shingles Patch	Decreased Depth.
518	„ Tees Bay—Saltscar	Buoy to be altered.
519	„ Morecambe Bay—Danger Patch	Buoy to be altered.
520	Scotland—N. Minch — Stornoway — Hen and Chickens	New beacon.
521	Ireland—S. Cst.—Ballycottin	Band on lighthouse.
522	„ S.W. Cst.—Old Head of Kinsale and Bull Rock	Fog-signals.
523	Baltic—Oregrunds—Singon—Rastensudde	New light.
524	„ G. of Bothnia—Russian Cst.	Various new lights.
525	Norway—S. Cst.	Various new lights.
526	„ S. Cst.	Various new shoals.
527	„ W. Cst.—Harö Fiord—Mien Is.	New shoal.
528	„ „	Various new lights.
529	France—N. Cst.—Somme River—Cayeux	New light.
530	„ „ Seine River—Honfleur	Fog-signal altered.
531	„ „ Cape Barfleur	New beacon.
532	Portugal—Peniche—Cape Carvoeiro	Fog-signal repairing.
533	„ Cape Roca	Light partly obscured seaward.
534	Spain—Cadiz—El Diamante	Light beacon on shoal.
535	Mediterranean—Sicily—Terranova	New light.
536	„ Adriatic—Le Catene Chan.	Lights altered.
537	„ „ Lussin Is. — Lussin Grande	Harbour light.
538	„ Greece—Eurpo—Cape Vasilina	New light.
539	Black Sea—G. of Azov—Petchany	Light and fog-signal altered.
540	Red Sea—Massawa Harb.	Lights altered.
541	Africa—Port Natal—Aliwal Shoal	New lights to mark shoal.
542	„ S.E. Cst.—Bashee River	New beacon.
543	Madagascar—W. Cst.—Bembatooka Bay	Various shoals.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
544	INDIA—Bombay Harb.—North Chan.	Lights on beacon.
545	BAY OF BENGAL—G. of Martaban—Krishna Shoal	Light to be altered Jan., 1893.
546	MALACCA STRAIT—E. Shore—Kwala Lingi	Light discontinued.
547	CHINA SEA—Borneo—N. and E. Cst.	Newly-discovered dangers.
548	„ „ N.W. and N. Cst.	Dangers, buoyage, &c.
549	„ Makassar Str.—Komba Is., &c.	Non-existence.
550	CHINA—N. Cst.—Shantung Promontory	Light altered.
551	JAPAN—Nipon—Owari Bay—Toba	Shoals in fairway.
552	„ „ Tokyo Gulf—Uraga Chan.	Provisional light.
553	RUSSIAN TARTARY—America Bay—Povorotny	Light and fog-signal.
554	AUSTRALIA—Inner Route	Position of rocks.
555	„ . Moreton Bay——Howe or N. Chan	Alteration in lights.
556	TASMANIA—Macquarie Harb.—Entrance Islet	Red Sector.
557	SOUTH PACIFIC—Tonga or Friendly Is.—Falcon Is.	Decreasing in height.
558	„ Solomon Is.	Various shoals.
559	NORTH PACIFIC—Sandwich Is.—Honolulu	Dredged Channel.
560	ALASKA—Shumagin Is.—Simeonoff Is.	Shoal ground.
561	SOUTH AMERICA—Rio de la Plata—C. San Antonio—Rasa Pt.	New light.
562	WEST INDIES—Great Bahama Bank—Ship Chan.—North Rock	New light, Jan., 1893.
563	UNITED STATES—Mass.—Nantucket Shoal	Light-vessel altered.
564	„ „ „ Sound	Buoyage.
565	„ Maine—Great Round Shoal and Pollock Rip	Light-ves. and fog-signals altered.
566	NOVA SCOTIA—S.E. Cst.—Port Dover	New light.
567	NEWFOUNDLAND—Ingornachoix Bay—Rich Pt.	New light.

NAUTICAL NOTICES.

All bearings Magnetic unless otherwise stated.

516.—ENGLAND.—*South Coast.—Needles Channel.—Hurst Lights.*—It is intended on or about the 3rd May, 1893, to make the following changes in the Hurst lights:—The *high* light will be increased in power, and will remain, as heretofore, *F. white* between the bearings of S. 48° W. and about S. 70° W.; but will be changed to *Occ.*, giving *one occultation* every 10 seconds (8 seconds light, and 2 seconds dark) from N. 78° E., through south, to S. 48° W. The *Occ.* light will show *white* from N. 78° E. to N. 88° E.; *red* from N. 88° E. to N. 89° E. (to cover the Solent Bank); and *white* from N. 89° E. to S. 67½° E. A *white occulting* light, of *less* power will be shown from S. 67½° E. to S. 48° W. The

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low light will be increased in power, but will remain *F. white* between the same bearings as heretofore, viz., from about S. 45° W. to about S. 78° W. Further notice will be given.

517.—ENGLAND.—*East Coast.—River Thames Entrance.—Duke of Edinburgh Channel.—Decreased Depth on Shingles Patch.*—Staff Commander Maxwell, H.M. surveying-vessel *Triton*, reports that the water on Shingles patch has decreased to 16 ft. The outline of the shoal, or the contour line of 5 fathoms, is practically unaltered. Approx. position of shoalest part, lat. 51° 31′ 50″ N., long. 1° 17′ 35″ E.

518.—ENGLAND.—*N.E. Coast.—Tees Bay.—Saltscar Buoy.*—It is intended in about a month to substitute a bell buoy, which will also exhibit an *Occ.* gas light, for the present buoy at the Saltscar station. Further notice will be given.

519.—ENGLAND.—*West Coast.—Morecambe Bay.—Danger Patch Buoy.*—It is intended in about a month to substitute a buoy showing an *Occ.* gas light for the present buoy at the Danger patch station. The gas buoy will be placed 2¼ cables west of the position occupied by the present buoy. Further notice will be given.

520.—SCOTLAND.—*West Coast.—North Minch.—Stornoway Approach.—Eye Peninsula.—Beacon on Hen and Chickens.*—An iron pillar beacon, surmounted by a ball, the whole 18 ft. in height and painted red, has been erected on Hen and Chickens, southward of Chicken head, south end of Eye peninsula, western side of North Minch. Approx. position, lat. 58° 10′ 35″ N., long. 6° 15′ 30″ W.

521.—IRELAND.—*South Coast.— Ballycottin Lighthouse.* — On or about 15th April, 1893, a black band will be painted on Ballycottin lighthouse; the band will be in the centre of the tower and will occupy about one-third of its height.

522.—IRELAND.—*S.E. Coast.—Establishment of an Intended Fog-Signal on Old Head of Kinsale, and Alteration of Fog-Signal on Bull Rock.*—On and after the 1st day of February, 1893, a fog-signal will be established on the Old Head of Kinsale. It will consist of two guns which will be fired in *quick succession* at intervals of 10 minutes. On the same date the fog-signal on Bull rock will be changed from two explosions every 10 minutes to two explosions every 15 minutes.

523.—BALTIC.—*Swedish Coast.—Öregrunds Inner Channel.—Singön.—Light on Rästensudde.*—It is a *Fl. white* light, visible from the bearing of N. 56° W. to N. 32° W., and from S. 56° E. to S. 32° E.; in other directions obscured. Elevated 23 ft., seen about 6 miles. Ill. app. of 6th order. Lighthouse circular, painted white. Approx. position, lat. 60° 18′ 20″ N., long. 18° 44′ E. *Variation*, 6° *W.* Not constantly attended to; will be exhibited from 15th August to 15th December, also from 1st April to 1st May.

524.—BALTIC.—*Gulf of Bothnia.—Russian Coast.*—(1.) *Nystad Approach.*—(*a.*) *Light on Haanperäumäki Island.*—Is an *Alt. white and red* light, visible from the bearing of N. 42° W., through east, to

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S. 42° E.; elevated 89 ft. above the sea (25 ft. above the ground), seen about 11 miles. Approx. position, lat. 60° 46′ 30″ N., long. 21° 15′ E. (*b.*) *Light on Ristikari Island.*—Is an *Alt. white and red* light, visible from the bearing of N. 41° W., through east, to S. 31° E.; elevated 19 ft. above the sea (15 ft. above the ground), and seen about 9 miles. Approx. position, lat. 60° 46′ 25″ N., long. 21° 18′ 30″ E. The two above mentioned lights (*a*, *b*) are in line when bearing N. 64° E., S. 64° W., and lead between the shoals towards Enskärs fiord and Krista sund. (*c.*) *Light on Syväsalmenkari Island.*—Is an *Alt. white and red* light, visible from the bearing of N. 65° W., through east and south, to S. 66° W.; elevated 8 ft. above the sea (5 ft. above the ground), and seen about 4 miles. Approx. position, lat. 60° 46′ N., long. 21° 14′ 30″ E.

(2.) *Raumo Approach.*—(*a.*) *Additional Light on Valkiakari Island.*—Is an *Alt. white and red* light, visible from the bearing of N. 18° W. to N. 63° W., and is situated about one cable from the previously existing light on the island; elevated 17 ft. above the sea (11 ft. above the ground), and seen about 9 miles. Approx. position, lat. 61° 9′ 45″ N., long. 21° 21′ 45″ E. The two lights on Valkiakari island in line bearing N. 41° W. lead in the fairway towards Irviluoto island.

Note.—The old light (*alternating*) on Valkiakari island is now visible from the bearing of S. 56° E., through south and west, to N. 69° W.

(*b.*) *Light on Irviluoto Island.*—Is an *Alt. white and red* light, visible from the bearing of N. 86° W., through south and east, to N. 54° E.: elevated 19 ft. above the sea (5 ft. above the ground), and seen about 9 miles. Approx. position, lat. 61° 7′ 15″ N., long. 21° 25′ 40″ E. *Variation*, 5° *W.*

525.—Norway.—*South Coast.*—(1.) *Langesund.*—*Light on Figgeskjær.*—It is an *Alt. red and white* light, visible from the bearing of S. 17° E., through west, to N. 13° E.; elevated 16 ft. above the sea, and seen 6 miles. Lighthouse, 19 ft. high, a small wooden structure on iron piles. Approx. position, lat. 59° 1′ 10″ N., long. 9° 45′ 20″ E.

(2.) *Tönsberg Fiord.*—*Leading Lights at Barkevig.*—The lights at Barkevig, west coast of Tiömö, are *F. white* lights, visible from the bearing of about N. 25° E. to N. 35° E., and showing with greatest intensity when in line bearing N. 30° E., leading eastward of S.E. (Sydost) grund and Mefiaren, and eastward of Lyng rock (Lyngholmhausen), Svartebo, and Nylandsboen. The south light is elevated 48 ft. above the sea, and 10 ft. above the ground. Approx. position, lat. 59° 6′ 30″ N., long. 10° 28′ 15″ E. The north light is elevated 137 ft. above the sea (10 ft. above the ground), and seen 8 miles. It is situated about 886 yards from the south light. Approx. position, lat. 59° 6′ 55″ N., long. 10° 23′ 25″ E.

(3.) *Light at Ostre Vakerholm.*—The light at Ostre Vakerholm, on the west side of Tiömö channel, is an *Alt. red and white* light, visible from the bearing of S. 5° W. (leading eastward of Korsholmen), through west, to N. 15° E. (leading eastward of Bölene, but over Rodskjær, and

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the sunken rocks (Boerne) northward to Svartskjærskaten, on which there is an iron perch), elevated 15 ft. above the sea (10 ft. above the ground) and seen 6 miles. Approx. position, lat. 59° 8′ 20″ N., long. 10° 22′ 50″ E.

(4.) *Light at Saltbu.*—The light at Saltbu, east side of Tiömö channel, is an *Occ. white* light, visible from the bearing of S. 9° W. (leading westward of Saltbufluen), through east, to N. 9° E. (leading westward of Budalsskjærene towards Barkevig), elevated 30 ft. above the sea (10 ft. above the ground) and seen 6 miles. Approx. position, lat. 59° 9′ 55″ N., long. 10° 22′ 55″ E.

Note.—Ostre Vakerholm and Saltbu lights nearly in line lead close eastward of Svartskjærskaten.

(5.) *Light at Tuten.*—The light at Tuten, northward of Vrængen, is an *Occ. white* light, visible from the bearing of N. 53° W., through north, to N. 79° E., from land to land, on the north side of the fairway; elevated 47 ft. above the sea (10 ft. above the ground), and seen 6 miles. Approx. position, lat. 59° 10′ 55″ N., long. 10° 24′ 15″ E. *Variation*, 12° *W.* These lights will be exhibited annually from 15th July to 31st May.

526.—Norway.—*South Coast.*—(1.) *Shoals near Torbiönskiær.*—(*a.*) A shoal (*Ribbegrunden*) with 3 fathoms water on it, lies in approximately lat. 59° 0′ 5″ N., long. 10° 48′ E. (*b.*) A shoal (*Bergalfluen*) with 5 ft. water on it, lies in approximately lat. 59° 0′ N., long. 10° 46′ 55″ E. One cable northward of Bergalfluen there is a patch with a depth of 6 fathoms. (*c.*) A shoal (*Skonnertgrunden*) with a depth of 5 fathoms, lies in approximately lat. 58° 59′ 50″ N., long. 10° 48′ 10″ E. (*d.*) A shoal (*Grotviggrunden*) with 3 fathoms water on it, lies in approximately lat. 58° 59′ 25″ N., long. 10° 47′ 50″ E.

(2.) *Shoal in Löhe Channel.*—A shoal with 4 fathoms water on it, lies in the fairway of Löhe channel, in approximately lat. 59° 4′ N., long. 10° 58′ 30″ E.

(3.) *Shoal in Ödegaardskiten.*—A shoal, consisting of two pinnacles, about half a cable apart in a north and south direction, lies in Ödegaardskiten. Approx. position of northern pinnacle, lat. 59° 7′ 45″ N., long. 11° 1′ 55″ E.

527.—Norway.—*West Coast.*—*Harö Fiord.*—*Shoal N.W. of Mien Island.*—A shoal (*Guldfluen*), with 2 ft. water on it, lies N.W. of Mien island on the east shore of Harö fiord, in approximately lat. 62° 41′ 50″ N., long. 6° 35′ 50″ E.

528.—Norway.—*West Coast.*—(1.) *Sandö.*—*Light on Langedrogneset.*—It is an *Occ.* light, showing *white* from the bearing of S. 48° E. (leading northward of Hella) to S. 28° E. (leading northward of Flesene); *red* from S. 28° E. to S. 68° W.; again *white* from S. 68° W. (leading eastward of Langflua) to N. 66° W. (leading northward of Kleveskjær); and in other directions obscured; elevated 34 ft. above the sea (10 ft. above the ground), and visible 6 miles. Approx. position, lat. 62° 16′ 5″ N.,

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long. 5° 29′ E. *Variation*, 16° *W.* Exhibited from 25th January to 8th April.

(2.) *Lofoten Islands.—Vest Vaago.—Mortsund Light on Gulholmen.* —It is an *Occ.* light, visible from the bearing of N. 80° W. (leading northward of the northernmost sunken rock in the East channel) to S. 77° W.; from S. 86° E. to N. 81° E. (leading northward of the northernmost holm in the West channel); and from N. 36° E. to N. 31° E. Shows *red* over Dynan in the harbour, and over Leiversboen in the West channel; through the other sectors of light it shows *white*, and is obscured elsewhere; elevated 47 ft. above the sea (10 ft. above the ground), and seen 6 miles. Approx. position, lat. 68° 4′ 35″ N., long. 13° 40′ E. *Variation*, 11° *W.*

(3.) *Lofoten Islands.—Light on Risværholmen.*—It is an *Alt. red and white* light visible from the bearing of S. 68° E. (leading northward of Engelsholmgruden), through south, to N. 11° W. (leading eastward of Varvær and Varværboen), and is obscured in other directions; elevated 39 ft. above the sea (16 ft. above the ground), and seen 6 miles. Approx. position, lat. 68° 16′ N., long. 15° 9′ 45″ E. *Variation*, 10° *W.* The two Lofoten lights will be exhibited annually from 15th August to 30th April.

(4.) *Tiel Sund.—Sandtory.—Light on Ostre Fjelddalsflua.*—It is an *Occ.* light, visible from the bearing of S. 78° W., through south and east, to N. 67° E. (leading northward of Ramstadgrunden), and is obscured in other directions; shows *red* leading southward of Haarberg and eastward of Kobstengrund; *green* over Storboen, and *white* through the other sectors of light. Elevated 19 ft. above the sea, and seen 6 miles. Lighthouse, 18 ft. high, a small white wooden structure on iron piles, above a stone foundation. Approx. position, lat. 68° 34′ N., long. 16° 33′ E. *Variation*, 9° *W.*

(5.) *Vaags Fiord.—Harstad.—Light on Tyo.*—It is an *Occ.* light, showing *white* from the bearing of S. 37° W. (leading eastward of Maagö and Rökenæsboen), through west, to N. 3° W. (leading eastward of Lökholmen), is obscured from N. 3° W. to N. 23° E.; shows *white* from N. 23° E. (leading westward of Arnö) to N. 28° E. (leading eastward of Stangenaslandet); *red* from N. 28° E., through east, to S. 79° E.; *white* from S. 79° E. (leading northward of Næsset) to S. 5° E. (leading westward of Svartskjær); and is again obscured from S. 5° E. to S. 37° W.; elevated 33 ft. above the sea (10 ft. above the ground), and seen 6 miles. Approx. position, lat. 68° 48′ N., long. 16° 38′ 30″ E. *Variation*, 9° *W.* The two last mentioned lights exhibited annually from 1st September to 14th April.

529.—France.—*North Coast.—Somme River Approach.—Cayeux.—Permanent Light.*—It is a *quick Fl.* light of 5th order, visible through an arc of 180°, and showing a sector of *white* light over south passage, Somme river entrance, a sector of *red* light northward of the white sector, and a sector of *green* light southward of it. The sector of *white* light is

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shown through an arc of about 8°, or from the bearing of N. 64° E. to N. 67° E. The sector of *red* light is visible through an arc of 146°, and the sector of *green* light through an arc of 31°. This light is of a different character at different periods of the tide. At or from 3½ hours before H.W., until 1½ hour after, the eclipses occur at intervals of *four seconds*, indicating that south passage may be navigated. At other times, the eclipses are in groups of two; in each group the two eclipses follow at an interval of about *two seconds*, and the first eclipse of each group is separated from the last eclipse of the preceding group by an interval of about *six seconds*. Approx. position, lat. 50° 11¾′ N., long. 1° 31′ E. *Variation*, 16° *W.*

530.—FRANCE.—*North Coast.—Seine River.—Honfleur.—Alteration in Fog-Signal.*—It is now a bell, struck by machinery *eight* times *every minute* when the depth of water in the port exceeds 6 ft.; situated on the extremity of the western pier at an elevation of 20 ft. above H.W. and 15 ft. above the pier. Approx. position, lat. 49° 25′ 35″ N., long. 0° 14′ 10″ E.

531.—FRANCE.—*North Coast.—Cape Barfleur.—Beacon on Rock Eastward.*—An iron pillar beacon, surmounted by a conical framework, the whole painted red and 18 ft. in height above H.W., has been erected on a rock lying E. ¼ S., nearly four-tenths of a mile from cape Barfleur lighthouse. Approx. position, lat. 49° 41′ 55″ N., long. 1° 15′ 30″ W. *Variation*, 18° *W.*

532.—PORTUGAL.—*West Coast.—Peniche Peninsula.—Cape Carvoeiro.—Fog-signal Temporarily Discontinued.*—Discontinued pending repairs to the machinery. Approx. position, lat. 39° 21½′ N., long. 9° 24′ W. Further notice will be given.

533.—PORTUGAL.—*West Coast.—River Tagus Entrance.—Cape Roca Light.—Temporarily Obscured from Seaward.*—Consequent on the construction of a new lighthouse for an intended *electric* light on Cape Roca, within a few yards of the present lighthouse, the light (*revolving white*) is obscured through an arc of about 32°, or approximately from the bearing of N. 2° E. to N. 34° E. Approx. position, lat. 38° 46¼′ N., long. 9° 30′ W. *Variation*, 18° *W.*

534.—SPAIN.—*South Coast.—Cadiz Harbour.—El Diamante Shoal.—Light Beacon.*—In course of construction on El Diamante shoal, north side of Main channel into Cadiz harbour. The depth over this shoal will be gradually decreased as the work advances, and it should be avoided even by small craft.

535.—MEDITERRANEAN.—*Sicily.—South Coast.—Light at Terranova.*—It is an *Occ.* light, with a period of *thirty seconds*, thus: light, *twenty seconds;* occultation, *ten seconds*. Visible through an arc of 135°, or between the bearings of N. 35° W., through north, and S. 80° E.; elevated 16 ft., and seen 9 miles. Ill. app. of 4th order. Lighthouse, a small building, square, and painted white. Approx. position, lat. 37° 3′ 40″ N., long. 14° 15′ 30″ E. *Variation*, 10° *W.*

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536. — MEDITERRANEAN. — *Adriatic. — Eastern Shore. — Le Catene Channel.—St. Domenica and Catene Point Lights.—Alteration in Characters.*—St. Domenica (Sta. Dominica) light, on the western side of Le Catene channel, is now *F. red*, and Catene point light, also on the western side of the channel, is now *F. white*. Approx. position of lights, lat. 42° 27¼′ N., long. 18° 40¾′ E., and lat. 42° 28¾′ N., long. 18° 41¼′ E., respectively.

537. — MEDITERRANEAN. — *Adriatic. — Gulf of Quarnero. — Lussin Island.—Harbour Light at Lussin Grande.*—Exhibited from an iron support (18 ft. high) erected about 18 yards within the point (*Cappellatta point*) at the east side of entrance to Lussin Grande; it is a *F. white* light, showing a sector of *red* light between the bearings of N. 87° W. and N. 64° W., towards Rovenska (Rovensen) mole and the shoal extending from it; elevated 29 ft. and visible (the white light) 4 miles. Approx. position, lat. 44° 31′ 25″ N., long. 14° 30′ 5″ E. *Variation*, 9° W.

Note.—Vessels entering the port of Lussin Grande should keep the white light in sight.

538.—MEDITERRANEAN.—*Greece.—East Coast.—Euripo.—Light on Cape Vasilina.*—It is a *Fl. white* light, with a *green* sector from N. 48° E. to the coast to the southward of the lighthouse, covering the dangers in that direction; elevated 33 ft. above the sea (31 ft. above the ground) white light visible 11 miles, and the green light 6 miles, Ill. app. dioptric of 6th order. Lighthouse, situated 77 yards southward of the extremity of the cape (south side of Oreos channel) constructed of masonry and square, with the keeper's dwelling near. Approx. position, lat. 38° 52′ 30″ N., long. 22° 52′ 10″ E. *Variation*, 7° W.

539.—BLACK SEA.—*Sea of Azov.—Gulf of Azov.—Petchany Light-Vessel.—Alteration in Character of Light and Fog-Signal.*—One *F. white* light is now exhibited from Petchany (Peschany) light-vessel, instead of two as previously; shown from the foremast, elevated 38 ft. The fog-signal on board the light-vessel is a bell, sounded during a period of *ten minutes*, with intervals of silence for *five minutes*. Approx. position, lat. 46° 59¼′ N., long. 38° 15½′ E.

540.—RED SEA.—*Western Shore.—Massawa Harbour Entrance.—Alterations in Lights.*—The light-vessel on the south side of entrance to Massawa harbour is replaced by a light buoy, from which is exhibited a *F. red* light. The buoy is moored with Mudur fort flagstaff bearing approximately S.S.W., distant 2¾ cables. Also, the *F. white* light of the light-vessel is now exhibited on Ras Mudur. *Variation*, 4° W.

541.—AFRICA.—*S.E. Coast.—Port Natal Approach.—Lights Marking Aliwal Shoal.*—(1.) The northern light, shown from the headland northward of Amahlongwana river entrance, is a *F.* light, showing *white* from the bearing of N. 50° W. to N. 30° W.; *red* from N. 30° W. to N. 19° E., over Aliwal shoal; and again *white* from N. 19° E. to N. 39° E.; in other directions obscured; elevated about

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170 ft., visible about 10 miles. Lighthouse, 84 ft. high, of iron, and conical, painted red and white in horizontal bands. Approx. position, lat. 30° 13′ 30″ S., long. 30° 47′ 45″ E. (2.) The southern light, shown from the headland southward of Umpambinyoni river entrance, is a *F.* light, showing *white* from S. 55° W. to S. 82° W.; *red* from S. 82° W. to N. 62° W., over Aliwal shoal; and again *white* from N. 62° W. to N. 35° W.; in other directions obscured; elevated about 159 ft., visible about ten miles. Lighthouse, 84 ft. high, iron, and conical, painted red and white in horizontal bands. Approx. position, lat. 30° 17′ 25″ S., long. 30° 45′ 30″ E. *Variation*, 27° *W.* Ill. app. of 4th order.

Note.—Vessels passing seaward of Aliwal shoal with one red light in sight will be about 6 miles from the shoal, and both red lights can only be seen at once when within that distance; vessels proceeding inside the shoal will pass in nearly mid-channel with one red light only in sight.

542.—Africa.—*S.E. Coast.—Beacon N.E. of Bashee River Entrance.* —In order to distinguish this part of the coast, a wooden beacon, 50 ft. in height, painted black, and presenting the shape of a diamond, has been erected on a round topped grassy hill, about 150 ft. above the sea, and situated about half a mile N.E. of Bashee river entrance. The beacon should be seen in clear weather 16 miles. Approx. position, lat. 32° 14′ 20″ S., long. 28° 54′ 30″ E.

543.—Madagascar.—*West Coast.—Shoals Westward of Bembatooka Bay.*—(1.) A shoal, with a depth of 1¾ fathom on it, lies with Anorombato point bearing S.E. by E., distant 9¼ miles; and Komani point E. by N. ¼ N. Approx. position, lat. 15° 39′ S., long. 46° 10¼′ E. (2.) A rocky shoal, nearly dry at L.W., stretches half a mile off the coast S.E. of Cavalier rock. Approx. position, lat. 15° 41′ S., long. 46° 12¼′ E. (3.) A shoal, with a depth of 3 fathoms on it, lies with Anorombato point bearing S.E. ¼ S., distant 13¼ miles, and Komani point east. Approx. position, lat. 15° 30¼′ S., long. 46° 8′ E. (4.) A shoal, with a depth of 3 fathoms on it, lies with Makambi northern point bearing E.S.E., distant 6 miles, and cape Tanjo W.S.W. Approx. position, lat. 15° 40¼′ S., long. 45° 50¼′ E. (5.) A shoal, composed of coral, with a depth of 4¾ fathoms on it, lies with cape Tanjo bearing S. by W. ¾ W., distant 4 miles, and northern point of Makambi E. ¾ S. Approx. position, lat. 15° 42¼′ S., long. 45° 42¼′ E. *Variation*, 12° *W.*

544.—India.—*West Coast.—Bombay Harbour.—Lights on North Channel Beacon.*—A *F. red* light above a *F. green* light, 2 ft. apart, is shown from North channel beacon while the dock gates are open, to assist vessels in navigating the dock channels; visible in all directions except where obscured by Cross island.

545.—Bay of Bengal.—*Gulf of Martaban.— Burma.—Krishna Shoal Light-Vessel. — Intended Alteration in Character of the Light.* — On 1st January, 1893, Krishna shoal light will be a *double Fl. white* light, showing *two flashes* in quick succession *every half minute* in the

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following order:—Flash *one and three-quarter seconds*, eclipse *four seconds*, flash *one and three-quarter seconds*, eclipse, *twenty-two and a-half seconds*. Approx. position, lat. 15° 86′ N., long. 95° 34½′ E. Should it be necessary, further notice will be given.

546.—Malacca Strait.—*Eastern Shore.—Lingi River.—Kwala Lingi Light.*—Is now discontinued. Approx. position, lat. 2° 23½′ N., long. 101° 58½′ E.

547.—China Sea.—*Borneo.—North and East Coasts.—Newly Discovered Dangers.*—From Commander A. M. Field, H.M. surveying-ship *Egeria*:—

(1.) *Banguey South Channel.*—A coral head (*Ten foot rock*), 70 yards long in an E.N.E. and W.S.W. direction, and 30 yards broad, with a least depth of 10 ft. at L.W. springs, and 17 fathoms close around, lies near the fairway of South Banguey channel, with Petrel rock bearing N.N.E. ¾ E., distant about 7 cables, or in approximately lat. 7° 8′ 50″ N., long. 117° 6′ 10″ E.

Caution.—As no less than three shoal patches have recently been discovered in the track usually followed in this part of Mallawallé channel, the utmost caution must be used in navigating this locality, as well as the whole channel to Sandakan, as it is more than probable that others exist as yet undetected.

(2.) *Lankayan Island.*—A coral patch (*Kechil rock*), about 8 cables in extent, with 4½ fathoms water on it, and 19 to 21 fathoms around, lies with Lankayan island bearing about S.W. ⅝ W., distant 7 miles. Approx. position, lat. 6° 84′ 40″ N., long. 118° 1′ E.

(3.) *Langaan Island.*—A coral patch (*Johnston rock*), 4 cables long in a N.N.W. and S.S.E. direction, and 2 cables broad, with 18 ft. on it at L.W. springs, and 18 fathoms around, lies with the S.E. extreme of Langaan island bearing S.W. ¾ W., distant $2\frac{3}{10}$ miles. Approx. position, lat. 6° 13′ 20″ N., long. 118° 11′ 15″ E.

(4.) *Nymph Reef.*—A coral shoal (*Royalist rock*), 4 cables long in a N.N.E. and S.S.W. direction, with a least depth of 6 ft. at L.W. springs near its S.W. end, and 18 fathoms around, lies with Nymph reef bearing N.N.E., distant about 1¼ mile. Approx. position, lat. 5° 42′ 50″ N., long. 118° 40′ E.

(5.) *Sunday bank*, previously known to exist, somewhat circular in shape and about 5 miles in extent, has depths of 9 to 47 fathoms on it, and deep water around. The shoalest part found (9 fathoms over coral) lies near its western edge in approximately lat. 5° 49′ 80″ N., long. 119° 9′ E.

(6.) A bank (*Normanby bank*), about 5 miles long in a N.N.E. and S.S.W. direction, and 2½ miles broad, has depths of 6 to 50 fathoms on it, and deep water around. The shoalest part found (6 fathoms over coral) lies near its S.W. end, in approximately lat. 5° 47′ N., long. 119° 13′ E. Soundings of 119 and 203 fathoms were obtained between this bank and Sunday bank.

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(7.) A bank (*Sentry bank*), the north edge of which has not been defined, but is probably about 7 miles in extent, has depths of 7 to 50 fathoms on it, and deep water around. The shoalest spot found (7 fathoms) lies about one mile within its western edge in approximately lat. 5° 40′ N., long. 119° 18′ E.

(8.) *Dent Haven.*—A narrow coral shoal (*Hardy patch*), 1¼ cable long in a north and south direction, with a least depth of 18 ft. at L.W. springs, lies in the approach to Dent Haven, in approximately lat. 5° 15′ 20″ N., long. 119° 18′ 20″ E.

(9.) *Sibuko or St. Lucia Bay.*—A coral head (*Hand rock*), about 50 yards in extent, and awash at L.W. springs, with 18 fathoms around, lies in the fairway of Sibuko bay, in approximately lat. 4° 8′ N., long. 118° 11′ E. This rock should be marked P.D. Also, a narrow coral patch, about 2½ cables long in an east and west direction, with a least depth of 14 ft. at L.W. springs near its west end, lies with Batu Tinagat, north shore of Sibuko bay, bearing E. by N. ½ N., distant about 8 miles. Approx. position, lat. 4° 12′ N., long. 117° 56′ E. *Variation*, 2° *E.*

548.—China Sea.—*Borneo.—N.W. and North Coasts.*—Information concerning a shoal lying off N.W. coast of Borneo, and the buoyage, etc., of Mallawallé channel, received from Commander A. M. Field, H.M. surveying-ship *Egeria* :—

(1.) *Shoal N.W. of Acis Shoals.*—A shoal (*James shoal*), with 12 fathoms water on it, and 22 to 31 fathoms around, lies about 25 miles N.W. of Acis shoals, in approximately lat. 4° 0′ N., long. 112° 18′ E.

(2.) *Mallawallé Channel.* — *Buoys and Beacons.* — (*a.*) *Billean Island.*—A *cylindrical* buoy, painted red and black in horizontal stripes, and surmounted by a black spherical cage (20 ft. above the sea), is moored on the east extreme of the 2½ fathoms shoal lying N.E. by N. from Billean island, with the north end of that island in line with the centre of Tagipil island bearing S. 36° W., in approximately lat. 6° 38′ 55″ N., long. 117° 47′ 50″ E.

Caution.—A shoal, with 3 fathoms water on it, lies about 1 mile N.E. ¾ E. from Billean buoy, which does not, therefore, mark the edge of the danger line N.E. of Billean.

(*b.*) *Leonan Reef.*—A beacon consisting of a framework iron tripod, surmounted by a black triangle, has been erected on the S.E. extreme of Leonan reef, with Kalangaan island bearing N. 74° W., distant 7¾ miles. Approx. position, lat. 6° 44′ 30″ N., long. 117° 37′ 40″ E. A small red buoy, surmounted by a ball (6 ft. above the sea), is moored with Leonan reef beacon bearing S. 61° W., distant 2¼ miles. (*c.*) *Sandy Island.*—A beacon, consisting of a framework tripod, painted red and black, and surmounted by a cage 35 ft. high, has been erected on Sandy island, with Sipindung island bearing E. 59° W., distant 4¼ miles. Approx. position, lat. 6° 49′ 30″ N., long. 117° 37′ 10″ E. (*d.*) *Sipindung Island.*—A small red buoy, surmounted by a ball (6 ft. above the sea)

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is moored with Sipindung island bearing N. 88° E., distant 1½ mile, or in approximately lat. 6° 50′ 45″ N., long. 117° 32′ 35″ E. *Variation*, 2° *E.*

Caution.—The route marked on chart has been followed with safety, but in such reef strewn waters other dangers not charted may exist.

549.—China Sea.—*Strait of Makassar.—Non-Existence of Komba Island, and Certain Islets.*—Komba (Noesa Komba) island, charted as lying in lat. 5° 15′ S., long. 117° 8½′ E., does not exist. Also, the three islets (Triangles) charted as lying in lat. 8° 1′ to 8° 5′ S., long. 117° 50′ E., and the three islets (P.D.) in lat. 2° 41′ S., long. 117° 56′ E., do not exist.

550.—China.—*N.E. Coast.—Shantung N.E. Promontory.—Alteration in Character of Light.*—Now altered to an *Occ.* light *every fifteen seconds*, visible *thirteen seconds*, and eclipsed *two seconds*. The sectors of light will remain unaltered. Approx. position, lat. 37° 24′ N., long. 122° 42½′ E.

551.—Japan.—*Nipon.—South Coast.—Owari Bay Entrance.—Shoals in Toba Anchorage.*—The three undermentioned rocky shoals, each about one cable in extent, and with 2¾ fathoms water on them, lie near the fairway of Toba anchorage, S.W. side of Owari bay entrance:—(1.) The north-eastern shoal lies with Cone (355 ft.) on Tafushi (Momotori) sima bearing N.W. by N., distant 4¼ cables. Approx. position, lat. 34° 30′ 50″ N., long. 136° 58′ 30″ E. (2.) The southern shoal lies with Cone bearing N. by W. ¼ W., distant 6¼ cables, and S.S.W. 2 cables from shoal (1). (3.) The western shoal lies with Cone bearing N. ¼ W., distant 4¼ cables, and W. by S. ¼ S. 2 cables from shoal (1). *Variation*, 4° *W.*

552.—Japan.—*Nipon.—South Coast.—Gulf of Tokyo or Yedo.—Provisional Light-Vessel in Uraga Channel.*—Placed to mark the position of a fort in course of construction in the north entrance to Uraga channel, pending the establishment of a light buoy. It shows a *F. red* light, elevated 25 ft., visible 4 miles; has two masts, is painted black, and carries a red flag as a day mark; moored with Kannon saki lighthouse bearing S. 10° E., distant 1$\frac{8}{10}$ mile. Approx. position, lat. 35° 17′ 10″ N., long. 139° 48′ 40″ E. *Variation*, 4° *W.*

553.—Russian Tartary.—*America Bay.—Light on Povorotny Point, and Intended Fog-signal.*—It is a *F. white* light, elevated 264 ft. above H.W., and visible 23 miles. Ill. app. dioptric of 1st order. Lighthouse, 35 ft. high, of stone and octagonal, painted red. Approx. position, lat. 42° 40′ 35″ N., long. 133° 2′ 30″ E. Also, it is intended to establish a fog-bell and siren near the lighthouse.

554.—Australia.—*East Coast.—Inner Route.*—The undermentioned dangers have been recently surveyed:—

(1.) *Particulars of Heath Rocks.*—Heath rocks, which dry at L.W., extend about 100 yards north, 200 yards east, and 80 yards south of the beacon erected on them in approximately lat. 13° 28′ 15″ S., long. 143° 39′ 50″ E.

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(2.) *Particulars of Khandalla Shoal.*—Khandalla shoal, with 13 ft. on it at L.W., is of small extent, and cannot usually be seen, even from the masthead. Approx. position, lat. 13° 26′ S., long. 143° 40′ 40″ E.

(3.) *Ellis Island.—Position of Beacon.*—The square black beacon on Ellis island (No. VII.) is situated on the centre of the Sand islet at its N.W. end. Approx. position, lat. 13° 22′ 15″ S., long. 143° 40′ 50″ E.

555.—Australia.—*East Coast.—Moreton Bay.—Howe or North Channel.—Alterations in Certain Leading Lights.*—Tangaluma light has been moved 466 yards N. ¼ E. from its previous position, and elevated 277 ft. above H.W. Approx. position, lat. 27° 11′ 30″ S., long. 153° 23′ 20″ E. *Variation*, 9° *E.* The southern limit of the sector of *white* light shown from Yellow Patch lighthouse has been altered to bear E. by S. instead of E. ¼ S., as formerly.

Note.—Vessels entering Howe or North channel should proceed as usual until Tangaluma and Cowan Cowan lights are in line bearing S. 17° E., and should keep them so, till the southern limit of the sector of *white* light shown from Yellow Patch lighthouse is reached, when the course should be altered to the eastward to bring Tangaluma light open eastward of Cowan Cowan light the difference in their heights, and then proceed with them in that position. By following this course, a depth of not less than 21 ft. at L.W. springs will be carried.

556.—Tasmania.—*West Coast.—Macquarie Harbour.—Entrance Islet Lighthouse.—Sector of Red Light.*—The sector of *red* light is now shown from Entrance Islet lighthouse, through an arc of 35°, or from the bearing of S. 16° E. to S. 19° W. This sector is intended to cover the north spit, which extends from Entrance Islet to the bar, and to guide vessels approaching from the northward when the inner leading light (*F. green*) is obscured by entrance islet. Approx. position, lat. 42° 11′ 35″ S., long. 145° 18′ 30″ E. *Variation*, 8° *E.*

Caution.—As the bar occasionally shifts to a greater or less distance from the north spit, mariners are cautioned that they should not depend on being clear of the spit, and in the channel, directly the light changes from red to white, but should proceed as previously with the leading lights in line.

557.—South Pacific.—*Tonga or Friendly Islands.—Falcon Island Decreasing in Height.*—Falcon island (volcanic), which in 1889 was 153 ft. high, is now only 25 ft. high. In all probability this indicates that the island is also much reduced in size, as it was rapidly washing away in 1889. Approx. position, lat. 20° 19′ S., long. 175° 25′ W.

558.—South Pacific.—*Solomon Islands.*—(1.) *Bauro or San Cristoval Island.—Shoal S.E. of Eyo Islet.*—H.M.S. *Royalist* reports the existence of a shoal, with an estimated depth of 6 to 10 ft. on it, lying with Eyo islet bearing N.N.W., distant about one mile. With much swell or in heavy weather the sea would probably break on this danger. Approx. position, lat. 10° 24′ 10″ S., long. 161° 23′ 45″ E.

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Note.—Near the coast, and N.E. by E. ½ E. from the above-mentioned shoal, is situated a village named *Bea*. From this village, and for about one mile to the south-eastward, a rocky ledge extends parallel to the beach, and about five cables from it, which dries at half tide.

(2.) *Guadalcanar Island.—Marau Sound.—Shoal Eastward of Square Island.*—A coral shoal, apparently small in extent, with about 5 fathoms water on it, lies off the Eastern entrance to Marau sound, with the north end of S.E. island bearing S. by W. ¾ W. and Square island W. by S. ½ S., distant about one mile. Approx. position, lat. 9° 49′ S., long. 160° 54½′ E. *Variation*, 8° *E.*

559.—North Pacific.—*Sandwich Islands.—Oahu.—Honolulu Harbour.—Dredged Channel at Entrance.*—A straight channel, 200 ft. wide, has been dredged to a depth of 30 ft. at L.W., from the 30 ft. line of soundings outside Honolulu harbour entrance, to the same depth within the harbour; and ships not exceeding 28 ft. draught may now safely enter. As the dredged channel does not appear to have yet been closely examined caution should, however, be observed.

Note.—Dredging operations will be continued in the harbour, in order to give depths of 30 ft. and upwards alongside the wharves, and afterwards to increase the depths in the harbour generally.

560.—Alaska.—*Shumagin Islands.—Shoal Ground Reported S.E. of Simeonoff Island.*—Captain A. A. C. Parr, H.M.S. *Melpomene*, reports that shoal ground, with a depth of about 7 fathoms, is said to exist with Simeonoff island bearing between W.N.W. and N.W., distant 20 to 35 miles. "Seven fathoms reported hereabouts," has been placed on charts, in approximately lat. 54° 30′ N., long. 158° 45′ W. *Variation*, 21° *E.*

561.—South America.—*East Coast.—Rio de la Plata.—Cape San Antonio.—Light on Rasa Point.*—It is a *Fl. white* light *every thirty seconds*, visible *twelve seconds*, and eclipsed *eighteen seconds*, elevated 190 ft. above H.W., and seen 20 miles. Ill. app. dioptric of 1st order. Lighthouse, 197 ft. high, of steel and tripod shaped, painted lead colour. Approx. position, lat. 36° 19′ 15″ S., long. 56° 46′ 15″ W.

Note.—From a recent determination by Argentine officials, the position is lat. 36° 18′ 24″ S., long. 56° 44′ 15″ W.

562.—West Indies.—*Great Bahama Bank.—Ship Channel.—Intended Light on North Rock.*—To be exhibited on 1st January, 1893, and will be known as Beacon cay light. It will be a *F.* light, showing *red* between the bearings of N.W. by W. ¼ W. and W. by N. ½ N. (marking the safe channel for vessels of 8 ft. draught); in all other directions the light will show *white*, except where partially obscured by the neighbouring islands between the bearings of N. ½ E., through north, and N.W. ¼ N.; elevated 54 ft. above H.W., and visible 8 miles. Ill. app. of 5th order. Lighthouse, 27 ft. in height, an octagonal white building, constructed of masonry. Approx. position, lat. 24° 52′ 30″ N., long. 76° 49′ 45″ W. *Variation*, 1° *E.* The beacon which formerly stood on north rock has been taken away.

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563.—United States.—*Massachusetts.—Nantucket New South Shoal Light-Vessel.—Alterations.*—Light-vessel No. 54 is now moored in 17 fathoms water S.W. of Davis (New) South shoal, and about 8¼ miles S.W. ½ S. from the previous position of Nantucket New South shoal light-vessel. It shows two *F. white* lights (reflector), one on each mast, visible about 11 miles. The vessel, painted red, has the words *Nantucket New South Shoal* in large white letters on her sides, and 54 in large white figures on each bow. She has two masts, is schooner rigged, but no bowsprit. The mastheads are white, and at each there is a red circular iron cagework day-mark. A black funnel and the fog-signal are between the masts. Approx. position, lat. 40° 47′ 45″ N., long. 69° 56′ 15″ W. *Variation*, 11° *W.* A steam whistle on board Nantucket New South shoal light-vessel will give alternate blasts in the following order :—Blast *two seconds* ; silence *twenty-eight seconds ;* blast *six seconds ;* silence *twenty-four seconds.* Further notice will give the exact position of the vessel, should it differ materially from the approximate position here given. *Variation*, 11° *W.*

564.—United States.—*Massachusetts.—Nantucket Sound, Eastern Entrance.—Buoyage.*—Consequent on a recent survey of the eastern entrance to Nantucket sound, the buoyage of that entrance has been arranged as follows :—

(1.) *Broken part of McBlair shoals, East*, No. 1, black, *can* buoy, in 54 ft. water, off the N.E. end of the broken part of McBlair shoals, with Sankaty head lighthouse bearing S.W. by W. ⅛ W., and Monomoy point lighthouse N.W. ¼ N. Approx. position, lat. 41° 25′ 25″ N., long. 69° 43′ 50″ W.

(2.) *Broken part of Great Round shoal, East*, No. 2, red, *conical* buoy, in 30 ft. water, off the east end of the broken part of Great Round shoal, with Sankaty head lighthouse bearing S.W. by W. Wly., and Monomoy point lighthouse, N.W. ¼ N.

(3.) *Broken part of McBlair shoals*, No. 3, black, *can* buoy, in 36 ft. water, on the north side of the broken part of McBlair shoals, with Sankaty head lighthouse bearing S.W. by W. ⅛ W., and Monomoy point lighthouse, N.W. ½ N. Nly.

(4.) *Broken part of Great Round shoal*, No. 4, red, *conical* buoy, in 60 ft. water, off the south side of the broken part of Great Round shoal, with Sankaty head lighthouse, bearing S.W. ⅛ W., and Monomoy point lighthouse, N.W. ⅛ N.

(5.) *McBlair shoals, East*, No. 5, black, *can* buoy, in 42 ft. water, off the N.E. part of McBlair shoals, with Sankaty head lighthouse, bearing S.W. by W. ¼ W., and Monomoy point lighthouse, N.W. by N.

The five above-mentioned buoys are new.

(6.) *Great Round shoal, East*, No. 2, red, *conical* buoy, has been moved about 4 cables southward of its previous position, is now numbered 6, and lies in 60 ft. water, with Sankaty head lighthouse, bearing S.W., and Monomoy point lighthouse, N.N.W. ⅛ W.

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(7.) *McBlair shoals*, No. 1, black, *can* buoy, is now numbered 7, and lies with Sankaty head lighthouse, bearing S.W. $\frac{3}{8}$ W., and Monomoy point lighthouse, N.N.W. $\frac{1}{8}$ W.

(8.) *Great Round shoal, South*, No. 4, red, *conical* buoy, is now numbered 8, and lies with Nantucket Great point lighthouse, bearing West, Sly., and Monomoy point lighthouse, N. by W. Wly.

(9.) *Fifteen foot shoal*, No. 1a, black, *can* buoy, is now numbered 9, and lies with Nantucket Great point lighthouse, bearing W. $\frac{3}{8}$ N. Nly., and Monomoy point lighthouse, N. $\frac{3}{8}$ W. Wly.

(10.) *Shoal off Great point rip*, No. 3, black, *spar* buoy, is now numbered 11, and lies with Sankaty head lighthouse, bearing S. $\frac{1}{4}$ W. Wly., and Nantucket Great point lighthouse, W by S. $\frac{3}{8}$ S.

(11.) *Great point rip*, No. 5, black, *spar* buoy, is now numbered 13, and lies with Monomoy point lighthouse, bearing N. by E. $\frac{1}{8}$ E., and Nantucket Great point lighthouse, S.W. by W. $\frac{3}{8}$ W.

(12.) *Mid-Channel whistle buoy*, black and white vertical stripes, was replaced on 30th September, 1892, by *Mid-Channel bell buoy*, black and white vertical stripes; it lies with Great Round shoal light-vessel bearing S.E. $\frac{3}{8}$ E., distant 4$\frac{1}{4}$ miles, and Nantucket Great point lighthouse, S.W. $\frac{1}{4}$ S.

(13.) *Nantucket Sound, Eastern Entrance Whistle Buoy.*—On the same date, a *whistle* buoy, painted black and white in vertical stripes was moored in 78 ft. water, with Great Round shoal light-vessel bearing West, distance 9$\frac{1}{4}$ miles. Approx. position, lat. 41° 26′ 15″ N., long. 69° 42′ 30″ W. *Variation*, 12° *W.* The depths given are at mean L.W.

565. — United States. — *Maine.* — (1.) *Great Round Shoal.*—*Alterations in Light-Vessel and Fog-Signal.*—Alterations made in the light-vessel and fog-signal, at the south extreme of Great Round shoal, entrance to Nantucket sound:—The lights are elevated 45 ft. above the sea, and visible 12 miles. Light-vessel will have the number 42, in large white figures, on each bow and on the stern. Approx. position, lat. 41° 24′ 20″ N., long. 69° 54′ 30″ W. A 12-inch steam whistle, in the light-vessel, will give one blast of *five seconds'* duration *every minute.*

(2.) *Pollock Rip.—Alterations in Light-Vessel and Fog-Signal.*—Alterations made in the light-vessel and fog-signal, at the S.E. part of Pollock rip, entrance to Nantucket sound:—The lights are elevated 37 ft. above the sea, and visible 11 miles. Light-vessel will have the number 47, in large white figures, on each bow. Approx. position, lat. 41° 32′ 20″ N., long. 69° 55′ 10″ W. A 12-inch steam chime whistle, in this light-vessel, will give one blast of *five seconds'* duration *every thirty seconds.*

566.—Nova Scotia.—*S.E. Coast.—Light in Port Dover.*—Exhibited from a lighthouse recently erected on the south end of *Callaghan island*, port Dover:—It is a *F. white* light, elevated 50 ft. above H.W., and visible 12 miles. Ill. app. dioptric, of small power. Lighthouse, 31 ft.

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high, a square wooden tower, painted white, lantern red, with keeper's dwelling attached. Approx. position, lat. 44° 29′ 25″ N., long. 63° 51′ 30″ W. *Variation*, 21° *W.*

Note.—Port Dover light bearing N.N.W. leads westward of Shag bay breakers, which are marked on their S.W. side by a red *can* buoy.

567.—Newfoundland.—*West Coast.—Ingornachoix Bay.—Light on Rich Point.*—Exhibited in place of that destroyed by fire in 1890:—It is a *Rev. white* light, showing *two bright rays* with an interval of *fifteen seconds* between their points of greatest brilliancy, followed by an interval of *thirty seconds* (during the greater part of which the light is eclipsed), the complete revolution thus occupying *forty-five seconds;* elevated 98 ft. above H.W., and visible 15 miles. Ill. app. catoptric. Lighthouse, on the site of the old building, an octagonal wooden structure, painted white, with red lantern, and 58 ft. in height. Approx. position, lat. 50° 41′ 50″ N., long. 57° 24′ 30″ W.

Coast of Norway.—*Steam Rescue Ship.*—Until the end of December, 1892, the steam rescue-ship *Heimdal* will cruise on the coast of Norway. The ship is painted light gray, has a yellow funnel, two masts, and carries a red ball at the masthead or below the gaff. When at sea during the night, she burns every hour or oftener (according to circumstances), red, white, and green flares. The *Heimdal's* address is Egersund.

Icebergs in the Indian Ocean.—The commander of the s.s. *Coptic* reports, that between lat. 50° 9′ S., long. 99° 40′ E. and lat. 49° 35′ S., long. 108° 37′ E., thirteen icebergs were passed.

Note.—Ice in this locality in this quantity is not frequent at this time of year, though the records show it has occurred before. Taken in conjunction with the mass of ice at present in the South Atlantic, it appears probable that there has been an unusual dislocation, and spreading north of the southern ice, and caution should be used. (*See* also *N.M.*, Nov. No., p. 1070.)

North Atlantic.—*Telegraph Buoy Adrift.*—The master of the yacht *Olivia* reports having passed, on 14th September last, a large iron telegraph buoy, drum shaped, painted red, and marked No. 15 in white figures, when in approximately lat. 40° 20′ N., long. 62° 58′ W. The buoy was dented, having apparently been struck by some vessel; and as it is floating 18 to 20 feet above water, and is of considerable weight, it presents a danger to shipping. In this locality, the current usually sets in an east-north-east direction about 40 miles a day.

Note.—The barque *Brunette* passed, on 26th July last, when in about lat. 35° 0′ N., long. 48° 45′ W., a large iron buoy, of reddish colour, and floating about 10 feet above water. In this locality, the current usually sets in a north-east direction about 20 miles a day.

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OUR OFFICIAL LOG.

CHARTS WHOLLY OR PARTIALLY RE-DRAWN.

Board of Trade, Marine Department,
2nd November, 1892.

THE following Admiralty Charts have recently been newly issued, or so largely corrected as to render a new Chart desirable. The date of the alteration is notified in the centre of the bottom of the Chart.

NOTE.—Charts that have received such alterations as can usually be made by hand on the Charts in use, in agreement with the "Notices to Mariners," are not described in the List below. The date of such alteration is shown at the left-hand lower corner of the Chart.

Chart No.	Title of Chart.	Nature and Subject of Correction.
2006	Scotland, W.: River Clyde, from Greenock to Dumbarton ..	Correction throughout. October.
2007	Scotland, W.: River Clyde, from Dumbarton to Glasgow.. ..	Amendment throughout. Republication. October.
1679	Mediterranean: Harbours and anchorages in the Archipelago..	Problaka Bay. September.
2757	China Sea: Banka Strait to Singapore	Correction throughout. October.
1593	Borneo, E.: Darvel Bay, Silam Harbour	New Chart. October.
1736	New Hebrides, Malekula Island (Mallicolo I.), Port Sandwich ..	New Chart. October.
2290	England, S.: Exmouth Harbour	New Chart. October.
2613	France, N.: Sheet XI., Barfleur to Cape D'Antifer	Havre Road and River Seine Entrance. September.
2379	Black Sea: Kherson or Dniepr Bay	New Chart. October.
2402	China Sea: Straits of Durian, Moro, and Jambul	Amendment throughout. September.
1995	China Sea: Singapore Road ..	Large corrections. November.
952	Japan, Nipon, S.: Owasi Bay to Takamatsuno Saki, including Owari and Mikawa Bays ..	Amendment throughout. October.
2766	New Guinea, N.E., &c.	Amendment throughout. October.
764	Anchorages in New Hanover, New Ireland, and New Britain ..	N. of Gazelle Peninsula, and E. of Crater Peninsula, New Britain. October.
55	Anchorages in New Britain, New Ireland, and New Guinea ..	Plans added, Herbert Shōh, New Britain, and Hatzfeldt Harbour, New Guinea. November.
396	Central America: Cape La Vela to Chagres, with the southern coast showing the Gulf of Panama	New Chart. October.

Agent for the sale of Admiralty Charts, MR. J. D. POTTER, 31, *Poultry, London, E.C.*

THE Board of Trade have awarded gold medals to Domingo Raffo, master, and Ernesto Bartolazzi, engineer, and silver medals and a sum of money to Geronimo Traverso and Angel Promone, seamen, of the steam-tug *Plata*, of Monte Video, in recognition of their services in

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rescuing the crew of the barque *Kaffir Chief*, of Banff, which was wrecked on the rocks near Monte Video on the 20th September last.

The Board of Trade have awarded their bronze medal for gallantry in saving life at sea, to Frank D. Pengelly and E. W. Nickels in recognition of their services in rescuing from drowning two of the crew of a boat belonging to the stranded steamship *Viscount Castlereagh*, which capsized in Dunkirk Harbour on the 22nd October, 1892.

The Board of Trade have awarded their silver medal for gallantry and a sum of money to R. Roer, master, and their bronze medal and a sum of money to H. Helders, J. Gill, J. Jensen, and J. Betts, seamen of the ship *Rescue*, of Stanley, Falkland Islands, in recognition of their services in rescuing, on the 16th March last, the shipwrecked crew of the ship *Viscount*, of Liverpool, which was wrecked on Sea Lion Islands on the 10th March.

The Board of Trade have awarded a binocular glass to Mr. J. Carlsson, master of the Swedish barque *Jacob Raners*, of Gothenburg, in recognition of his kindness and humanity to the shipwrecked crew of the barque *Princess Alexandra*, of Belfast, which was abandoned in the North Atlantic on the 28th October last.

Her Majesty the Queen has been graciously pleased to confer the decoration of the Albert medal of the second class on William Borland, sapper of the Partially Paid Submarine Mining Corps, Sydney, N.S.W. The following is an account of the services in respect of which the decoration has been conferred:—On the 3rd April, 1891, a boat, containing 12 men and two officers, was engaged in submarine mining operations about half a mile from the shore at Middle Head, Sydney, N.S.W. By the accidental explosion of a 100 lb. gun-cotton mine, the after part of the boat was blown to pieces and the two officers and two of the men were instantly killed, while the others were all more or less severely injured. Sapper William Borland, finding the boat sinking, jumped overboard in order to lighten her, and, whilst holding on to the gunwale, supported sapper Brentnall, who was semi-conscious. Another of the crew, named Adams, in the excitement of the moment, jumped overboard, but when some yards away, called out for help, as he was unable to swim. Borland at once swam to his assistance, and supported him until a boat arrived from the shore some considerable time after. Borland was nearest to the explosion of any of the crew, and received severe wounds on the face, arms, abdomen, and legs, besides injuries to both ears. He was in hospital several weeks, and could not follow his ordinary work for some months.

The Board of Trade have received through the Foreign Office a gold life-saving medal which has been awarded by the President of the United

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States to Mr. William Davies, master of the late barque *Kaisow*, of London, in recognition of his humane conduct in effecting the rescue of the crew of the American barque *Nereid*, on the 8th October, 1891, in Valparaiso Harbour, Chili.

The Board of Trade have awarded their bronze medal for gallantry in saving life at sea to Mr. George Watts, chief officer, and Charles Boyle, chief boatman of coastguard at Donna Nook, for their gallant and praiseworthy services at the wreck of the Russian barque *Albert* on Haile Sand on the 14th October, 1892.

The Board of Trade have awarded their silver medal for gallantry in saving life to Mr. William H. Bullock, chief officer of the steamship *Floridian*, of Liverpool, in recognition of his services in rescuing a seaman who had fallen overboard while that vessel lay alongside a wharf at Colon on the night of the 31st July, 1892.

Official Inquiries at Home, 1892.

4598. *Dora*, s.s.; built at Govan, 1889; owned by London and South Western Railway Company, gross tonnage, 812; Guernsey to Southampton; 7 passengers; struck Tasse Rock, N.E. coast of Guernsey, and sustained damage, September 17, 1892. Inquiry held at Westminster, October 15, 1892, before Marsham, Judge; Parish and Ronaldson, N.A. Casualty caused by master neglecting to pay proper attention to leading and clearing marks for Little Russell Channel. Certificate suspended for three months, recommended for one as mate.

4600. *Camiola*, s.s.; built at South Shields, 1889; owned by Mr. R. Chapman and others; tonnage, 1,459; Barry to Malta; coal; struck the Seven Stones, off Cornwall, and foundered, October 1, 1892. Inquiry held at Newcastle, October 17, 1892, before Hunter and Nelson, Justices; Ward and Cuninghame, N.A. Casualty caused by mate having inexcusably mistaken the Seven Stones and Round Island Lights for the Longships and Wolf respectively. Master also showed dereliction of duty in remaining below without satisfying himself as to character of lights reported. Both their certificates suspended for six months.

4601. *Freuchny*, barque; built at Garmouth, 1875; owned by Mr. A. Hendry and others; tonnage, 824; Barbadoes to Progresso, Yucatan; ballast; stranded on Playa Larga Reef, Isle of Pines, Cuba, September 12, 1892. Inquiry held at Aberdeen, October 24, 1892, before Brown, Judge; Bain and Bragg, N.A. Stranding owing to vessel being set north-westward by an abnormally strong current, and to error of judgment of master in not making allowance for leeway on the fine course he was steering.

4602. *Casket*, barque; built at Bridport, 1869; owned by Messrs. Piper and Crinks; tonnage, 302; Huelva to Wilmington; iron pyrites; stranded on Frying Pan Shoals, N. Carolina, U.S.A., September 13, 1892. Inquiry held at Plymouth, October 27, 1892, before Harris

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and Pitts, Justices; Parfitt and Brooks, N.A. Stranding owing to courses set not having been made good, in consequence, probably, of a N.E. current with which the master was not at the time acquainted, and to his error in judgment in heaving vessel to on the wrong tack.

4603. *Janus*, s.s.; built at Grangemouth, 1883; owned by Messrs. J. Kish and others; tonnage, 699; Vockkro to Honfleur; deals; stranded on Haisborough Sand, October 16, 1892. Inquiry held at Sunderland, October 29, 1892, before Wilson and Stokoe, Justices; Cosens and Richardson, N.A. Stranding due to master mistaking the Leman and Ower Light for Smith's Knoll Light, and to his taking no proper measures to verify his position. Certificate suspended for six months; recommended for one as mate.

4604. *Cyrus*, s.s.; built at Grangemouth, 1883; owned by Mr. J. Kish and others; tonnage, 698; Archangel to London; deals, stranded off Ona Light, Norway, October 4, 1892. Inquiry held at Sunderland, October 27, 1892, before Booth and Doxford, Justices; Cosens and Richardson, N.A. Stranding due to careless navigation. The master did not leave proper instructions, and neglected to come on deck when vessel was reported to be drawing near land. Conduct of first mate in giving up charge, and of second mate in taking over charge incomprehensible. All reprimanded.

4611. *Catherine*, coble, and *Benan*, s.s.; former owned by R. Coulson; tonnage, 8; Tees to Whitby; mussels; latter built at Whitehaven, 1878; owned by Anitor Steamship Company, Limited; tonnage, 712; Tees to Decido; ballast; in collision off Middlesbrough, October 8, 1892, when owner of coble was drowned. Inquiry held at Whitby, November 11, 1892, before Chapman and Wright, Justices; Methven, Ward, and Kiddle, N.A. Collision owing to the inefficient look-out on the *Benan*. Certificate of second mate suspended for six months.

4612. *Castelia*, schooner, and *Irwin*, s.s.; former built at Jersey, 1876; owned by Messrs. Le Masurier and Prosser; tonnage, 69; Saint Nazaire to Lannion Seven Islands; ballast; latter built at Sunderland, 1883; owned by Irwin Steamship Company, Limited; tonnage, 610; La Lazza, Spain, to Leith; sulphur ore; in collision off Ushant, October 14, 1892, when former sank and one life was lost. Inquiry held at Newport, November 11, 1892, before Stevens and Graham, Justices; Wilson, Dyer, and Brooks, N.A. Casualty owing to master of *Irwin* having allowed his vessel during daylight and clear weather to approach near the *Castelia* with the intention of passing ahead of her, and finding he could not do so, improperly attempting to go under her stern, when too late. Certificate suspended for three months.

FISHERY INQUIRY, 1892.

S. 65. *Telephone*, ketch, and *Hartville*, s.s.; former built at Rye, 1889; owned by Mr. T. Hatton; tonnage, 24; engaged trawling; latter

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built at West Hartlepool, 1879; owned by Mr. W. MacLean and others; tonnage, 1,052; South Shields to Pireaus; coal; in collision off the Kentish Knock, August 5, 1892, when former sank and two lives were lost. Inquiry held at Ramsgate, October 26, 1892, before Hamond and Vaile, Justices; Anderson and Baker, N.A. Collision due to careless navigation of mate of *Hartville*, the collision having occurred during broad daylight. Certificate suspended for twelve months. *Telephone* was not supplied with life buoys or belts.

Official Inquiries Abroad, 1892.

4599. *John Rennie*, barque; abandoned in lat. 58° S., long. 70° W., August 4, 1892, when on voyage from South Shields to Valparaiso with coal, lead and iron. Inquiry held at Valparaiso, September 2, 1892. Vessel experienced heavy gales, lost bulwarks, and became unmanageable. Abandonment justifiable.

4605. *Orfordness*, s.s., and *Nea Omonia*, Greek brig; in collision in Doro Channel, October 17, 1892, when latter sank and two lives were lost. Inquiry held at Malta, October 20, 1892. Collision due to brig not showing a bright light astern when overtaken; and to second mate of steamship not at once stopping engines on seeing, during a flash of lightning, the sailing-vessel right ahead. Certificate suspended for two months. Master of steamship censured for not being in charge when in a frequented channel.

4606. *Strathearn*, barque, abandoned on fire about 20 miles N.N.W. of Chanaral, September 1, 1892, when three days out on voyage from Valparaiso to Carrizal Bajo, in ballast. Inquiry held at Valparaiso, September 21, 1892. No evidence as to cause of fire.

4607. *Karoola*, barquentine, stranded in Herbert River, but sustained no damage, July 26, 1892. Inquiry held at Geraldton, August 19, 1892. Casualty owing to master not anchoring when leading marks and buoys could not be seen. Ordered to pay costs, £3 3s.

4608. *William and Alexander*, ketch, wrecked in Terrigal Boat Harbour, August 21, 1892. Inquiry held at Sydney, August 29, 1892. Casualty owing to moorings parting during a gale.

4609. *Edith May*, schooner, stranded at Wanganui Heads, July 24, 1892, when one life was lost. Inquiry held at Wanganui, N.Z., August 8, 1892. Casualty caused by master remaining at anchor when there was every prospect of bad weather. Certificate suspended for six months, and ordered to pay costs, £5 11s.

4610. *Hydra*, s.s., and a tongkang, in collision in Singapore Harbour, September 16, 1892, when latter sank and one life was lost. Inquiry held at Singapore, September 29, 1892. *Hydra* solely to blame for not complying with Art. 17 of the Regulations, and for keeping a bad look-out. Certificate of mate suspended for three months.

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NOTES.

GOVERNMENT BOAT LOWERING COMPETITION.—The Belgian Government have recently been experimenting at sea with various boat engaging and disengaging gears, with a view of fitting the most efficient one to their Royal Mail and other Government steamers. The trials were of a most exhaustive and searching nature, consisting of lowering and disengaging the boat with the ship steaming fifteen knots per hour, suspending the boat in the various positions that it might be placed in, through the davits tackles fouling, and then disengaging; hooking on tests, to get the boat out of the water; trying to upset the boat through one davit tackle only being engaged. These experiments resulted in the officers declaring in favour of the gear of Captain F. S. Pett, of Dover, this being the only gear that had successfully passed through the whole of their tests. On one occasion the boat fitted with Captain Pett's gear was lowered, disengaged, and a life buoy picked up within a half minute, the vessel steaming at the rate of fifteen knots per hour at the time. This gear has been in use for the last eight months on the Royal Mail packets running between Ostend and Dover. The same gear has been in constant use during the last twelve months on the Trinity pilot steamer *Guide;* and has also been used upwards of one thousand times in the shipping of pilots in the English Channel with the greatest success. Captain Barlow (Supt. Cinque Ports pilots) and some fifty captains and Trinity pilots have testified to the efficiency of this patent.

IT is gratifying to be able to record a further advance in care for the best interests of seamen, not as a consequence of legislation, or of the agitation of Trades' Unions. In the *Constance*, owned by Mr. E. T. Gourlay, of Sunderland, just built by Messrs. Short, of the same port, there is a room in the forecastle fitted up as a library and reading-room for the crew. There are also separate rooms bulkheaded off as mess-rooms for the firemen and the seamen, and a separate bath-room for each class. The *Constance* is a cargo steamer of 4,000 tons.

RECENT strandings of H.M. ships have shown the value of the double bottom system of construction, and also the excellence of the material of which the vessels are built. The

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Apollo, during the late manœuvres on the Irish Coast, struck the rocks very heavily, but on docking for repairs at Chatham it was seen what a large amount of damage a vessel of cellular construction might receive and yet be able to take care of herself afterwards. The first indication of damage was at about 20 feet from the stern, and from this point aft plating has been more or less removed, and the framing was exposed. For the first 60 feet the vessel's keel scraped on the rock, and the damage is but slight. For another 25 feet, the bottom is flattened, and the frames are bent up over a large area, some as much as 4 inches, but the skin of the vessel is not ruptured up to this point. For about 70 feet onwards, further aft, the skin of the outer bottom is torn through, and the floors are doubled up to a height of a foot to seventeen inches, but still the inner bottom is not rent. There are other rents and punctures in this part of the ship, and the strain, doubtless, must have been immense; but the remarkable point is that it is all taken up in tearing the outer bottom, and bending the floors, and that the inner bottom stood throughout, and, consequently, the ship kept afloat.

A COMMITTEE has been appointed by the Chamber of Shipping of the United Kingdom and the Shipping Federation for the consideration of a victualling scale for merchant ships. It is understood that the Board of Trade will assist in the enquiry, by allowing their officers to give evidence, but have declined to nominate a member. The chairman is Mr. William Milburn, steamship owner of London, Newcastle, and Cardiff; and there will be representatives of Shipmasters' and Officers' Federation of the United Kingdom, the General Shipowners' Society, the Clyde Shipowners' Association, the Steam Shipowners' Association, the Employers' Labour Association, and the Shipowners' Association of Liverpool.

THE New York Yacht Club recently published the report of a special committee, appointed to consider Lord Dunraven's challenge, and to arrange a match. They recommended a relaxation of the terms of the deed of gift to the extent that no dimensions save length upon water line need be given by the challenger, with the addition that neither competing yacht should exceed the length as given by more than two per cent. Any excess should be counted double in calculating the time allowance. Lord Dunraven, it is stated, has since agreed to the conditions, and a race next year is now looked upon as certain.

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THE United States Consul at Batoum states in a report that while the product of the Russian petroleum district amounted in 1885 to 32 million gallons, in 1891 it amounted to 268 millions. The trade this year has been in a somewhat depressed condition, owing to low prices resulting from over-production, but the total output will probably exceed 400 million gallons. The United Kingdom last year took over 46 million gallons of petroleum from Batoum, India coming next with 39, Austria-Hungary 32, Turkey 24, Belgium 22, Java 14, China 12, and Japan 11 millions.

THE Americans have for some time claimed that their armour plates made from high-carbon nickel steel were of better resisting power than any others. On the 2nd November, a test of a plate of this manufacture was made by the British Government at Portsmouth, the result being a complete verification of the reports received from America on the subject. The plate was 10½ inches thick, and stood the tests usually applied to plates of that thickness with astonishing success. Further plates are to be tested, and if the results are equally satisfactory, the nickel steel plate is likely to supersede the plates at present used.

DR. NANSEN has described before the Royal Geographical Society his projected expedition to the North Polar regions. His ship, the *Fram*, has been built and launched; the Norwegian Parliament having voted £10,500 for the purpose, and King Oscar having given £1,050. The ship is a small one, and will only take a crew of twelve, her displacement being 800 tons. She is built of oak and pitch pine, very thick and strong, and has an "ice-skin" of greenheart. She will have an auxiliary screw propeller, which can be lifted, and will have dynamo for generating electric light. Dr. Nansen's plan is to run east along the north coast of Siberia, and as far as the New Niberian Islands, and then to strike north. A current sets due north at that place, and there is reason to believe that it crosses the Pole, and then runs south again to the east coast of Greenland. He expects his ship to be shut in by an ice floe. She is built of such a form that, as the ice closes in round her, she will lift. If she is injured, he will encamp on the ice floe, and has two good decked boats with which to make his way out when the floe drifts south again. Dr. Nansen will sail from Sweden in the Spring, and will take provisions and fuel for five years.

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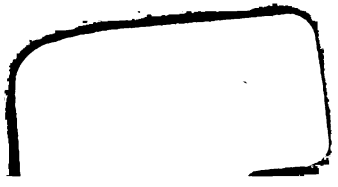

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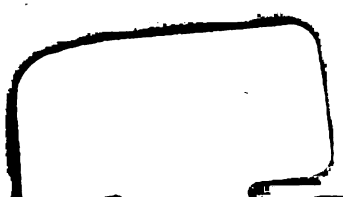

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